

OFFICE OF THE AIR FORCE SURGEON GENERAL

FELLOWSHIP PAPER

COMBAT MEDICAL MODERNIZATION: POSTURING LOW SUPPLY AND
HIGH DEMAND ASSETS TO MEET EMERGING AND FUTURE
CAPABILITY REQUIREMENTS



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A Research Report Submitted to HQ AF/SG35X

In Partial Fulfillment of Medical Plans Fellowship Requirements

Defense Health Headquarters, Falls Church, VA

July 2015

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INTRODUCTION

This paper is a collaborative project, conducted by the Headquarters Air Force and Air Combat Command Medical Plans Fellow class of 2015, comparing three different medical capabilities (for informational purposes only) in an effort to present ideas on how best to use our scarce medical resources to fulfill emerging and future requirements. The authors of this project have completed nine overseas deployments and have been assigned to Aeromedical Evacuation at Joint Patient Movement Requirement Center (JPMRC), Aeromedical Evacuation Operations Team (AEOT) and Aeromedical Evacuation Liaison Team (AELT). The authors also have base level experience where they were involved in the transport of over 12K patients, and have been an integral part of standing up Theater Lead Agent Medical Materiel – Pacific (TLAMM-P) as well as leading an MFST (Mobile Field Surgical Team) team in the CENTCOM Area of Operation (AOR). This boots-on-the-ground perspective is useful in providing information to readers of this project to better treat, evacuate and care for our warfighters.

This paper will present three unique but similar capabilities for comparison: Mobile Field Surgical Team and Expeditionary Critical Care Team (MFST/ECCT), Special Operations Surgical Team (SOST), and Tactical Critical Care Evacuation Team and Tactical Critical Care Evacuation Team-Enhanced (TCCET/TCCET-E). In an effort to understand the similarities and differences between these three capabilities, the current en-route system will first be defined, and then each capability will be further analyzed independently by looking at the following elements: mission, Air Force Specialty Code (AFSC) composition, training platform, and equipment assemblages. Comparing the different elements of these capabilities provides the framework to discuss operational challenges of each capability as it relates to current and future operational environments. Identifying operational challenges leads to the development of broad Courses of

Action (COAs) that may lay the foundation to mitigate these challenges and enhance the overall casualty movement system.

CURRENT MEDICAL EN-ROUTE CARE SYSTEM

Medical Roles of Care

Medical roles of care provide the basic foundation for how ground and en-route medical capabilities are developed. Ground medical capabilities (i.e. Expeditionary Medical Support-EMEDS) provide resuscitative or supportive care until the patient can be moved, while en-route medical capabilities focus on medical care during transport. As seen in Figure 1, movement through the different Roles of Care is a linear process that relies on the ability to get a patient from the Point of Injury (POI) to the appropriate level of care without being impeded by the enemy.¹ Joint Publication 4-02 defines the different “Roles of Medical Care” as²:

Role 1. The first medical care military personnel receive from the POI is provided at Role 1 (also referred to as unit-level medical care).

Role 2. Role 2 provides advanced trauma management and emergency medical treatment including continuation of resuscitation started in Role 1. Role 2 provides a greater capability to resuscitate trauma patients than is available at Role 1.

Role 3. In a Role 3, the patient is treated in an MTF or veterinary facility (for working animals) that is staffed and equipped to provide care to all categories of patients, to include resuscitation, initial wound surgery, and post-operative treatment. This role of care expands the support provided at Role 2.

Role 4. Role 4 is medical care found in US base hospitals and robust overseas facilities.

¹ Ms. Shaun Carter, “Joint Patient Movement”, presentation, JMOC, Andrews AFB, MD, 9 December 2014.

² JP 4-02, *Health Service Support*, 26 July 2012.

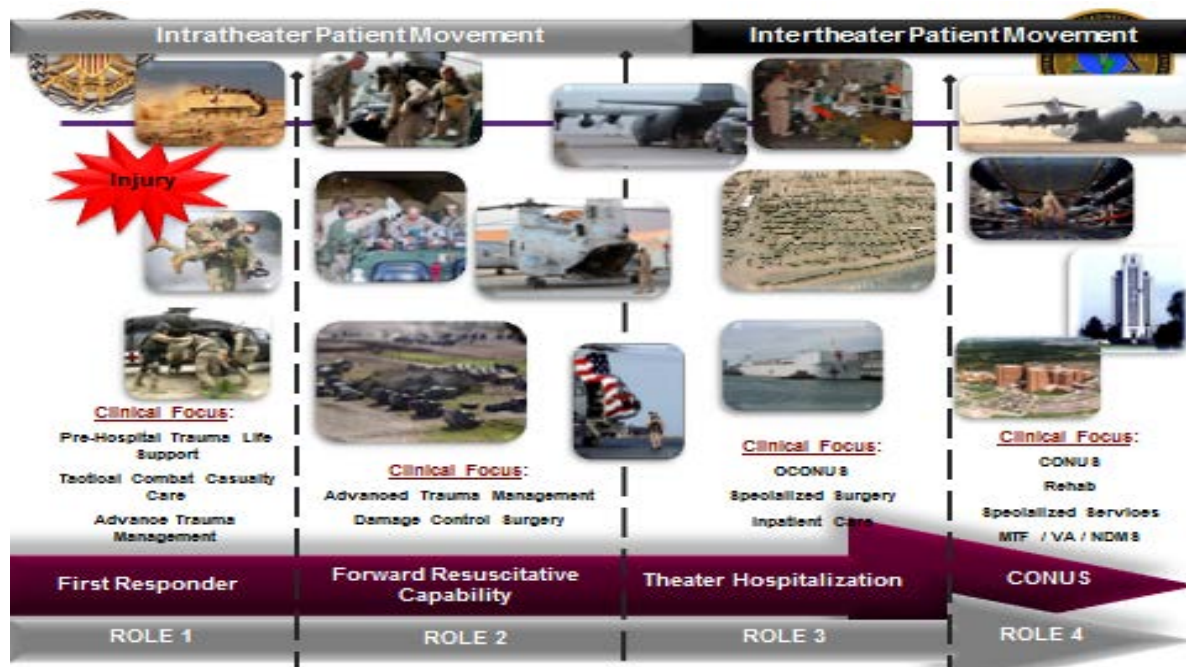


Figure 1. Medical Roles of Care

Patient Movement

The current patient movement system is linear in nature and focuses on moving patients to the appropriate level of care within the appropriate timeframe to receive life-saving care (i.e. “Golden-Hour”). Patient movement, through the different echelons of care, occurs in two distinct phases (Intratheater and Intertheater³). Intratheater patient movement can be conducted on all three casualty movement platforms while Intertheater movement utilizes Aeromedical Evacuation (AE). The casualty movement platforms are defined further below:

Casualty Evacuation (CASEVAC) - A term used by all Services, refers to the unregulated movement of casualties aboard ships, vehicles, or aircraft.

Medical Evacuation (MEDEVAC) - Traditionally refers to USA, USN, USMC, USAF, and USCG patient movement using predesignated tactical or logistic aircraft (both fixed-wing and rotary), boats, ships, and other watercraft temporarily equipped and staffed with medical attendants for en-route care.

³ DOD Dictionary of Military Terms, http://www.dtic.mil/doctrine/dod_dictionary/ [accessed 9 March 2015].

Aeromedical Evacuation (AE) - refers to the Air Force system providing time-sensitive en-route care to regulated patients to and between MTFs.

Intratheater movement provides the capability to move both regulated and unregulated patients—regulated patients are those that have been authorized to move by an approved validation source (i.e. Theater Patient Movement Requirements Center [TPMRC]).⁴

The current patient evacuation system heavily relies on its ability to transport patients to a higher level of care within a short timeframe. The current system is not built to provide prolonged treatment close to the point of injury. The average patient evacuation time from the AOR to CONUS during Desert Storm was 10 days versus 3 days now.⁵ As seen in Figure 2, the current system is a linear system that relies on a combination of regularly scheduled and unscheduled (priority and urgent) missions to pick up patients at forward operating locations and transport them to hubs or main operating base where they are aggregated and transported out of the Joint Operating Area (JOA) to higher levels of care (i.e. Intertheater Airlift).⁶

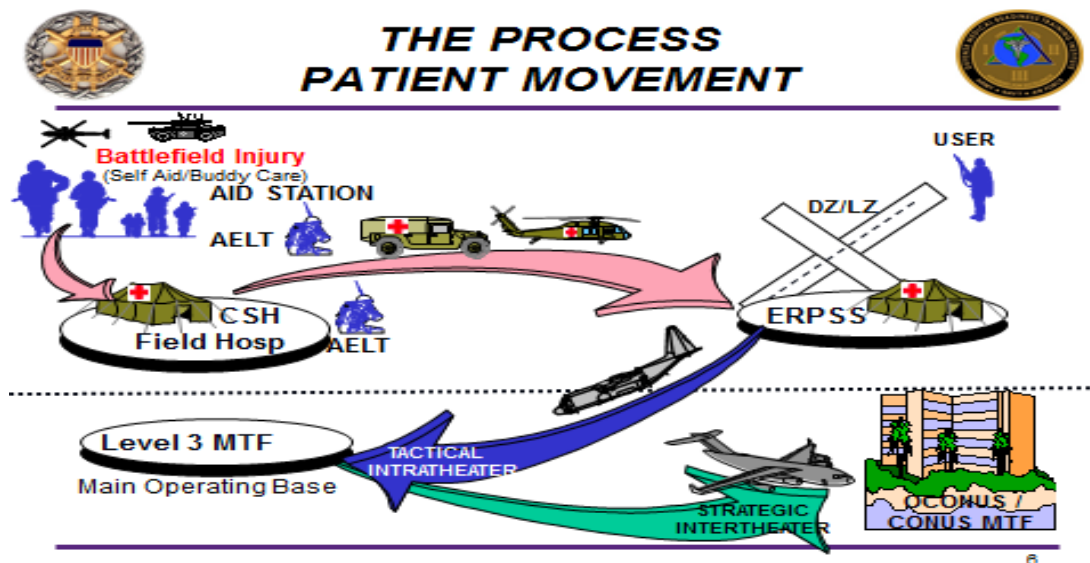


Figure 2. Patient Movement Process

⁴ Ibid.

⁵ Ibid.

⁶ Ibid.

Medical Capability Definitions

This paper will define, analyze, and compare several conventional and non-conventional medical capabilities. Each medical capability will be discussed in terms of how medical Unit Type Codes (UTC) support large medical capability sets. These capabilities comprise the different Medical Roles of Care and the Patient Movement Process. Medical UTCs provide a “modular and scalable design that allows the Air Force to deploy medical capabilities ranging from small teams that provide highly skilled medical care for a limited number of casualties to a large medical system”.⁷ In order to understand the operational challenges and COAs presented in this paper, the mission of each of the medical capabilities must first be defined (Figure 3).

Medical Capability Mission Description	
Medical Capability	Mission Description
Air Force Special Operations Command (AFSOC) Medical Support	Deploy with and in support of (ISO) Special Operations Forces (SOF) in order to deliver SOF combat medical support and to modernize and advance SOF medical capabilities, medical technologies IOT maximize war-fighter performance. SOF medics ensure deployable AFSOC forces via the employment of AFSOC medical UTCs. AFSOC medics deploy with SOF to provide preventive healthcare, routine healthcare, urgent/emergent point-of-injury trauma care, forward resuscitative/stabilization surgery, intensive care, CASEVAC and critical care casualty evacuation. ⁸
Expeditionary Medical Support (EMEDS)	Provide individual bed-down and theater-level medical services for deployed forces or select population groups. The primary mission is to provide forward stabilization, resuscitative care, primary care, dental services, and force health protection and prepare casualties for evacuation to the next level of care. EMEDS provides a modular buildup of capabilities that is organized into three increments: EMEDS Health Response Team (HRT); EMEDS+10, EMEDS+25. ⁹
Tactical Critical Care Evacuation Team	The TCCET provides deployed medical leadership a trauma/critical care capability to augment existing evacuation capabilities for casualties likely to benefit from advanced en-route damage control resuscitation/life-saving interventions, and critical care during unvalidated pre-hospital and MTF to MTF casualty movements. TCCET-E adds the additional capability of providing surgical assessment and en-route damage control surgery for unvalidated evacuation missions in theaters with limited in-theater surgical capability. ¹⁰

Figure 3. Medical Capability Mission Description

⁷ AFTTP 3-42.71, *Expeditionary Medical Support and the Air Force Theater Hospital*, 27 August 2014.

⁸ AFTTP 3-42.65, *Air Force Special Operations Command (AFSOC), Special Operations Surgical Teams (SOST) and Special Operations Critical Care Evacuation Teams (SOCCET)*, 1 May 2010.

⁹ Ibid.

¹⁰ AFTTP 3-42.58, *Draft Tactical Critical Care Evacuation Team*, 22 January 2015.

UTC CAPABILITIES

Special Operations Surgical Team (SOST) – Manpower Force Package Responsible Agency (MRA): SOCCENT

Medical Special Operations Forces (SOF) go through specialized training to operate in denied environments where casualty movements are often unregulated and require small tactical medical support teams with highly mobile equipment sets. The SOST UTC is a non-conventional capability that combines both a surgical and critical care capability—“six-person team that provides damage control/resuscitative surgical stabilization, advanced trauma life support, patient holding and critical care transport using both SOF and conventional evacuation platforms”.¹¹ SOST differs from conventional medical capabilities discussed below in the fact that this UTC is multi-functional, and can provide ground medical and en-route care without having to add additional capability. Expounding on training requirements, AFSC composition and equipment assemblages provides a framework for comparing similar conventional medical UTCs against it in an effort to identify operational challenges and develop courses of action that could increase flexibility in our conventional capabilities.

SOST – Training Overview

SOST training combines member orientation to the Special Operations community and provides the necessary skillset to provide medical support in a denied environment. The training prepares the member to stabilize and move regulated and unregulated patients on a wide-array of SOF and conventional patient movement platforms (i.e. CASEVAC, MEDEVAC, AE). The SOST training requirements are designed in three phases (Phase 1 Core Skills and Training [6-8 months to complete], Phase 2 Tactical Field Skills Training [4 months to complete], Phase 3 Advanced Team Training [2-4 years to complete]). It is important to note that SOF medical

¹¹ Ibid.

training differs from conventional medical UTC training in the fact that SOF personnel's primary duty is to train for operational missions/deployments versus work in a Medical Treatment facility.

Special Operations Surgical Team (SOST) Formal Training Requirements		
Course	Description	Duration
Introduction to Special Operations Command (ISOC)	This course is designed for Air Force Special Operations personnel filling or programmed for a position requiring knowledge of joint US special operations. It examines the historical evolution, development, organization, and mission activities of US Special Operations Command and its components. ¹²	5 Days
Introduction to Special Operations Medical (ISOM)	This course is designed for military officers, warrant officers, noncommissioned officers, and U.S. government civilian employees in comparable grades, serving the special operations forces (SOF) community or in direct support of the SOF medical community. The course explains SOF medical operations concepts and fundamentals of the United States Special Operations Command's (USSOCOM) mission, roles, and capabilities with a focus on medical operations in a joint SOF setting. ¹³	5 Days
Critical Care Aeromedical Transport Team Basic (CCATT) Course	The course provides an introduction to the aeromedical evacuation environment, familiarization training with aeromedical evacuation aircraft, altitude physiology and transport critical care training. ¹⁴	14 Days
Advanced Trauma Life Support (ATLS)	This course teaches a systematic, concise approach to the early care of the trauma patient.	10 Days
Center for Sustainment of Trauma and Readiness Skills C-STARS	All attendees will attend a 21-day course that offers: -- Trauma lectures -- High Tech Human Simulator Sessions -- Human Cadaver Lab -- Baltimore City Ambulance Rotation -- Trauma Resuscitations in the STC Trauma Resuscitation Unit (TRU), ICU, ER and John's Hopkins Regional burn ICU -- Equipment Skills Stations -- Maryland State Trooper Helicopter rotation (as available) -- Trauma/Critical Care case studies -- Clinical duties as determined by specialty	21 Days
Field Skills Training	This course is the primary field skills training course for AFSOC Medics—the goal of the Air Commando Basic SOF Medic Course is to graduate medical personnel with the basic field skill abilities to both operate in typical SOF environments and execute operational support to any of the USSOCOM core activities. There are six main areas of instruction: <i>Map, Compass, GPS and Land Navigation; Field Craft and Survival;</i>	56 Days

¹² Air Force Special Operations Command, "Introduction to Special Operations Command (ISOC)", 13 January 2015, accessed 15 Mar 2015,

<http://www.afsoc.af.mil/Units/AirForceSpecialOperationsAirWarfareCenter/USAFSOS/ISOC>

¹³ Ibid.

¹⁴ USAF School of Aerospace Medicine, Critical Care Air Transport (CCAT) Initial Course, 22 January 2014.

	<i>Communications; Small Unit Tactics; Vehicle Convoy and Defensive Driving; and Tactical Force Protection.</i> ¹⁵	
Survival, Evasion, Resistance, and Escape (SERE) Training	Trains students to handle the psychological and physical stress of survival, post-ejection procedures, survival medicine and parachute landing procedures. ¹⁶	19 Days
Casualty Evacuation (CASEVAC) Training	Trains special operations medical forces to retrieve, treat and transport wounded service members through any means possible, places students in stressful situations to help them apply their skill sets in locations they aren't familiar with. ¹⁷	14 Days
Trauma Sustainment Training	Sustainment training is completed through assignment to the University of Alabama Birmingham to perform clinical duties.	N/A

Figure 4. SOST Formal Training Requirements

SOST – Manpower Assessment

When analyzing the impact of training, manpower costs must be analyzed. The figure below (Figure 5) is using the Military Manpower Rates calculator for the cost comparisons. The Manpower Calculation Assumptions are: 260 man-days per year, 2,087 man-hours per year, 21.7 man-days per month. The calculator is using FY 2013 DoD composite rates only. The composite rates used in this calculator are published annually by the Office of the Secretary of Defense, Comptroller.¹⁸ In addition, the manpower rates are based on the rank requirement prescribed in the manpower detail for each UTC.

¹⁵ AFSOCI 48-101, *Aeromedical Special Operations*, 30 November 2012

¹⁶ BaseOps.net, “USAF Survival Evasion Resistance Escape (SERE)”, 2012, accessed 15 March 2015, <http://www.baseops.net/militarybooks/usafsurvival.html>

¹⁷ Whitney, Ryan, “AFSOC CASEVAC: Training for Care Under Fire”, 19 August 2010, accessed 15 March 2015, <http://www.travis.af.mil/news/story.asp?id=123218500>

¹⁸ DoD Cost Guidance Portal, “Attending An Event Guidance”, 1 January 2013, accessed 1 March 2015 <https://www.cape.osd.mil/CostGuidance/docs/AttendingOtherEventsGuidance.pdf> and <http://comptroller.defense.gov>

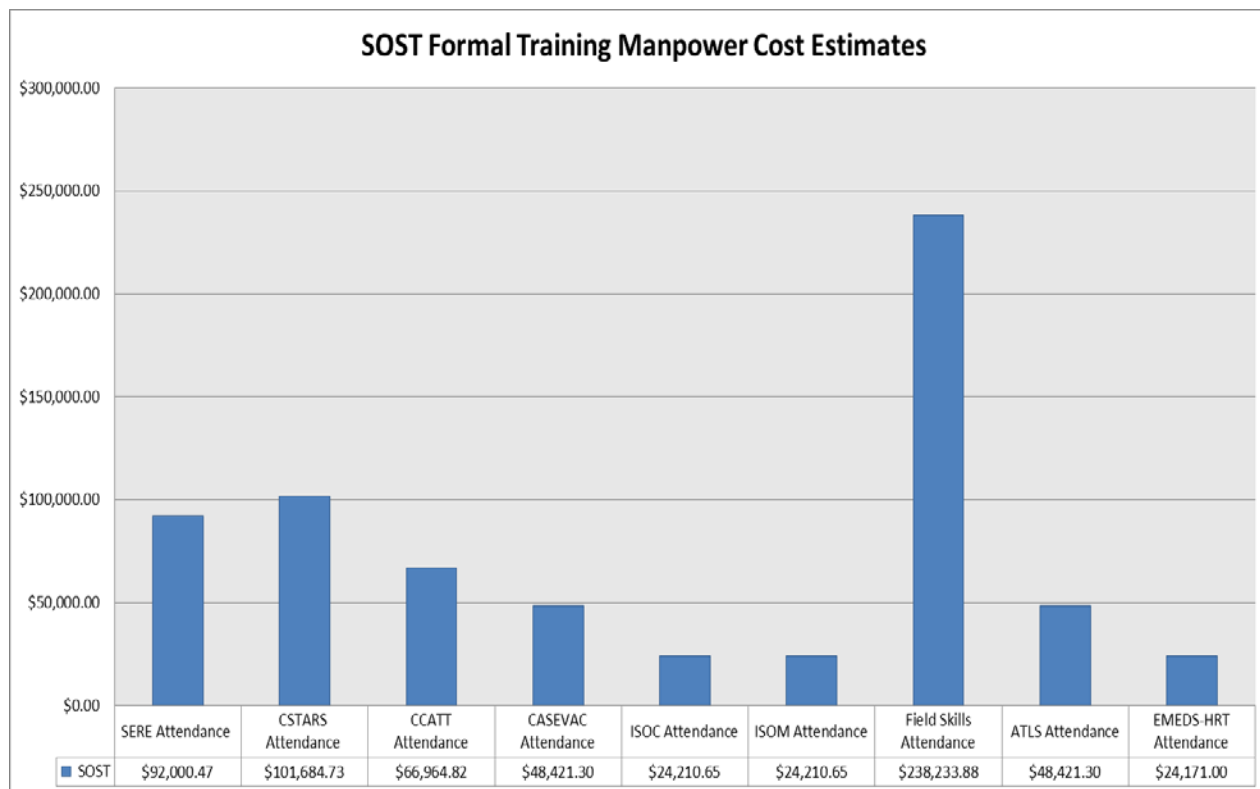


Figure 5. SOST Formal Training Manpower Cost Estimates

The key component to the manpower assessment is the comparison of Low Supply/High Demand (LS/HD) AFSC's. Seen below in Figure 6, the AFMS Prioritization and Sequencing Guidance has identified the following AFSC's as LS/HD¹⁹:

<ul style="list-style-type: none"> • 41AX – MSC (log & plans) • 42G3 – Physician Assistant • 42P3 – Psychologist* • 42S3 – Clinical Social Worker* • 44E3 – Emergency Physician* • 44FX – Family Practice Physician • 44M3X – Internist* • 44P3 – Psychiatrist* • 44Y3 – Critical Care Physician* • 45A3 – Anesthesiologist* • 45B3 – Orthopedic Surgeon* • 45S3X – Surgeon* • 46N3E – Nurse, Critical Care* • 46N3J – Nurse, Emergency* 	<ul style="list-style-type: none"> • 46P3 – Mental Health Nurse* • 46S3 – Operating Room Nurse* • 46Y3A – Women's Health NP • 46Y3H – Family Practice NP • 46Y3M – Nurse Anesthetist* • 48A/R/G – Flt Med Physicians • 4A0X1 SEI 260 – Med Systems • 4A1X1 – Med Logistics • 4C0X1 – Mental Health Service* • 4H0X1 – Cardiopulmonary Lab* • 4N071C – IDMT • 4N0X1 SEI 487 – Critical Care* • 4N1X1 – Surgical Service • 4R0X1 SEI 478 – CT Tech
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Figure 6. Low Supply/High Demand AFSC's

¹⁹ Air Force Medical Service Prioritization and Sequencing Guidance AEF Schedule 12-13 (IC), 27 February 2012

The table below gives a brief summary of Low Supply/High Demand (LS/HD) AFSCs that comprise the SOST, MFST/ECCT, and TCCET medical UTCs:²⁰

AFSC Classification Directory Summary	
AFSC	Description
Surgeon (45S3): LS/HD: YES UTC: SOST, MFST/ECCT, TCCET	Examines, diagnoses, and treats, by surgical and conservative means, diseases and injuries. Manages surgery services. Related DoD Occupational Group: 260130.
Orthopedic Surgeon (45B3): LS/HD: Yes UTC: SOST, MFST/ECCT	Examines, diagnoses, and treats diseases and injuries of musculoskeletal system by surgical and conservative means. Manages orthopedic surgery services. Related DoD Occupational Group: 260132.
Emergency Services Physician (44E3): LS/HD: Yes UTC: SOST, MFST/ECCT, TCCET	Examines, diagnoses, and treats initial and acute phase of illnesses and injuries. Directs emergency and related outpatient services. Directs disaster planning, training, and management in the prehospital and hospital access areas. Related DoD Occupational Group: 260105.
Anesthesiologist (45A3): LS/HD: Yes UTC: MFST	Administers general and local anesthetics; manages anesthesiological services. Related DoD Occupational Group: 260105.
Critical Care Nurse (46N3E/J): LS/HD: Yes UTC: SOST, MFST/ECCT, TCCET	Includes clinical nurses, clinical nurse specialists and nurse practitioners. Provides professional nursing care within scope of practice, established standards of care and federal and state laws. Acts as patient advocate and advances desired health outcomes through patient and family education. Coordinates with and makes recommendations to staff agencies concerning applicable policies, plans and programs. Participates in cross-functional collaboration to improve patient care delivery. Supports research activities. Related DoD Occupational Group: 260509.
Operating Room Nurse (46S3): LS/HD: Yes UTC: MFST	Provides professional nursing care within scope of practice, established standards of care and federal and state laws. Assesses, plans, implements, and evaluates perioperative nursing care. Plans, directs, and coordinates activities of the Operating Room Department. Coordinates with and makes recommendations to staff agencies concerning applicable policies, plans and programs. Participates in cross-functional collaboration to improve patient care delivery. Supports research activities. Related DoD Occupational Group: 260503.
Surgical Services Craftsman (4N171) LS/HD: Yes	Plans, provides, and evaluates routine patient care and treatment of beneficiaries to include flying and special

²⁰ Air Force Officer Classification Directory (AFOCD), 30 April 2013 & Air Force Enlisted Classification Directory (AFECD), 31 October 2014

UTC: SOST, TCCET	operational duty personnel. Organizes the medical environment, performs and directs support activities for patient care situations, including contingency operations and disasters. Performs duty as Independent Duty Medical Technician (IDMT), Aeromedical Evacuation Technician (AET), Hyperbaric Medical Technician (HBMT); Allergy and/or Immunization Technician (AIT), Special Operations Command (SOC) Medic, Dialysis Medical Technician (DMT), Critical Care Technician (CCT), Neurodiagnostic Technologist (NT), or Flight and Operational Medicine Technician (FOMT). Related DoD Occupational Subgroup: 130000.
Cardiopulmonary Laboratory Craftsman (4H071) LS/HD: Yes UTC: SOST, MFST/ECCT	Performs and manages cardiopulmonary laboratory functions and activities for noninvasive diagnostic cardiac procedures, invasive diagnostic and interventional cardiac procedures, pulmonary function testing, diagnostic and therapeutic bronchoscopies, and respiratory therapy. Related DoD Occupational Subgroup: 130000.

Figure 7. AFSC Classification Directory Summary

Figure 8 depicts a Venn diagram of the SOST UTC manpower demand by AFSC.²¹ This representation shows the AFSC's that comprise SOST UTC, and depicts which LS/HD AFSCs are shared across the other two UTCs (TCCET and MFST/ECCT). This striking visualization of the shared LS/HD AFSC's shows that each AFSC in the SOST UTC is being utilized by one or the other or both UTC's.

²¹ Ibid.

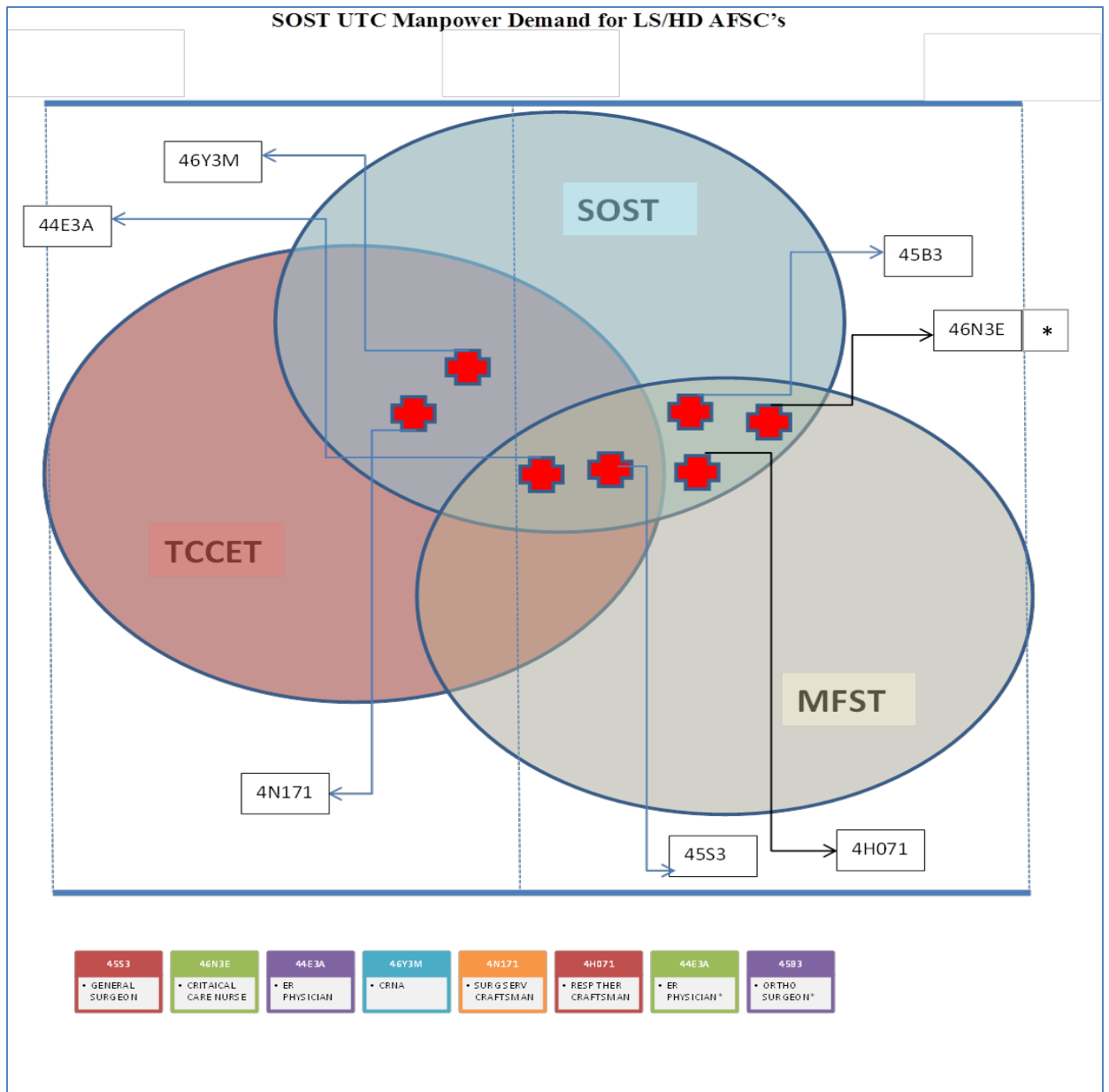


Figure 8. SOST UTC Manpower Demand for LS/HD AFSC's
 (* - As of 8 July 2015, the 4N171 has replaced the 46N3E on the MFST MANFOR)

SOST - Logistics/Equipment

Each equipment UTC has a very specific mission capability (MISCAP) that drives a determination for how much equipment is needed and required to perform the given mission.

The following is SOST MISCAP:

“Provides mobile capability to perform quick-reaction, highly advanced trauma life support, life-saving damage control surgery, pre/post - operative resuscitation and critical care, and CASEVAC aboard SOF aircraft and/or other opportune/civilian air, land or sea platforms in support of the full spectrum USSOCOM mission in various threat environments, locations and weather or light conditions, forward and independent of any established healthcare support systems. Deploys with surgical critical care response equipment packages, which are primarily contained in a highly tailorable, mission-modular man-portable packs. This UTC may be tailored to meet given mission requirements. BOS and security is required”.²²

The equipment package to support the SOST is organized in such a way that it can be palletized as personal or professional gear. The majority of supplies and equipment are maintained in five man-portable field packs. If the back packs are available upon arrival at the site, the initial operating capability can be achieved within fifteen minutes. The team requires shelter and potable water. Once operational, it can be self-sufficient for forty eight hours and then requires normal base operating support (BOS). The planning goal for medical support is to ensure surgical capability as close to the golden hour as physically possible. SOSTs are trained in SOF operating environments and may function in a stand-alone mode for short periods of time. They will typically be deployed as surgical augmentation with the Special Operation Force Medical Elements (SOFMEs) who provide the shelter, power, water, and other operational requirements. SOST can perform up to ten damage control surgeries utilizing the primary equipment package. SOST personnel, equipment and supplies can be transported by a single HMMWV or UH-60 Blackhawk helicopter or larger vehicle/aircraft.²³

²² MEFPAK/LODGET Analysis Tool, accessed 15 February 2015

²³ AF Tactics, Techniques, and Procedures (TTP) 3-42.65

The SOST equipment packages are modular and composed of six complementary allowance standards. The first increment can stand alone for initial care but all three are required to provide patients with optimal medical care to operate independently for short periods of time (e.g., disaster response). Capability is limited to the primary deployment package unless medical resupply is readily available. As such, SOST capability can be expanded modularly for larger scale operations of longer duration. It can provide critical orthopedic surgical care and/or additional emergency trauma medical support for specific missions where the risk of orthopedic injuries is high and/or additional need of emergency care might be critical.²⁴

SOST is designated as UTC FFQE3 and its associated equipment designated as UTC FFQEF (SOF Surgical Primary Response Equipment), FFQEE (SOF Surgical Electrical Equipment Augmentation) and FFQES (SOF Surgical Sustainment Package); the corresponding allowance standards (AS) are *912C*, *912D* and *912M*. The surgical capability is represented in UTC FFQE4 with its associated equipment designated as UTC FFQEB (SOF Critical Care Evacuation Primary Response Equipment), FFQEC (SOF Critical Care Evacuation Augmentation Equipment) and FFQED (SOF Extended Reach Medical Equipment); the corresponding AS are *912N*, *912Q* and *912R*.²⁵

Figure 9 provides a quick synopsis of the SOST equipment packages 912C v2, 912D v2 and 912M v2 AS including the weight, item count, and total cost.²⁶ The surgical capability is provided with additional three modular packages – 912N v2, 912Q v2 and 912R v2. The provided weight does not include the pallet, nets and dunnage and a regular pallet dimensions are considered to be 108” W x 88” L x 2-1/4” H w/ 10,000 lbs capacity.²⁷ For planning purposes, it

²⁴ AF Tactics, Techniques, and Procedures (TTP) 3-42.65

²⁵ MEFPAK/LODGET Analysis Tool, accessed 15 February 2015

²⁶ LOGMOD Database & <https://medlog.us.af.mil/index.cfm>

²⁷ www.463lpallet.com

is important to pay attention to the weight and space requirements of each package. Figure 10 provides a rolled up SOST equipment packages consisting of all 6 AS.²⁸ Again, these modular equipment packages build on each other in capability depending on mission requirements.

912C (FFQEF)	912D (FFQEE)	912M (FFQES)
4 pts or 10 resuscitative surgeries	4 patients	4 patients or 20+ surgeries
14 sub-assemblages	20 sub-assemblages	8 sub-assemblages
816 items	1056 items	364 items
\$184,602.85 total cost	\$198,332.67 total cost	\$119,684.28 total cost
577 lbs	713 lbs	1449 lbs
.25 pallet	.25 pallet	1 pallet

912N (FFQEB)	912Q (FFQEC)	912R (FFQED)
2 patients	2 patients	Supplies
9 sub-assemblages	13 sub-assemblages	1 sub-assemblages
499 items	999 items	37 items
\$84,377.50 total cost	\$175,506.20	\$16,696.59
500 lbs	1164 lbs	605 lbs
.25 pallet*	.5 pallet*	.25 pallet*

Figure 9. Quick Synopsis of SOST Equipment Packages (* Approximation)

SOST AS Rollup: All 6 AS Combined

65 sub-assemblages
3771 items (total)
\$779,200.09
5008 lbs
2.5 pallet*

Figure 10. SOST Merged Equipment AS (*Approximation)

²⁸ LOGMOD Database & <https://medlog.us.af.mil/index.cfm>

Mobile Field Surgical Team (MFST) & Expeditionary Critical Care Team (ECCT) – MRA: ACC

The MFST is a conventional rapid response capability that provides resuscitative surgery and emergency medical support at main and forward operating bases—the team is comprised of five personnel providing emergency medicine, general/orthopedic surgery, and operating room support for up to 10 resuscitative surgical/emergency support casualties or 20 “non-operative” resuscitations.²⁹ The ECCT “provides internal medicine and emergency medicine personnel to stabilize and prepare patients for movement to the next level of care. The team can stabilize and maintain four patients (three of which can be critical) for 24 hours”.³⁰ The MFST and ECCT are capability modules that make up part of the EMEDS force package—MFST has the capability to move forward with limited backpack capability, but the ECCT is a non-standalone capability that can operate independently from the EMEDS. Training and equipment assemblage requirements are explained further below.

MFST/ECCT – Training Overview/Manpower Assessment

The formal training for MFST and ECCT are much shorter than both the SOST and Tactical Critical Care Evacuation Teams (TCCET) teams. The EMEDS HRT course is designed to provide field operational training for commissioned officers and enlisted personnel assigned to specific Unit Type Codes (UTC) within the Expeditionary Medical Support (EMEDS) Unit. The course is designed to promote team performance, cohesion, cross training and utilization of all deployed team personnel. It teaches set-up and packing-out of field medical and operational

²⁹ Ibid.

³⁰ Ibid.

support equipment and field exercises to both emphasize and evaluate learning of the concept taught. Personnel will receive training based on the UTC they have been assigned.³¹

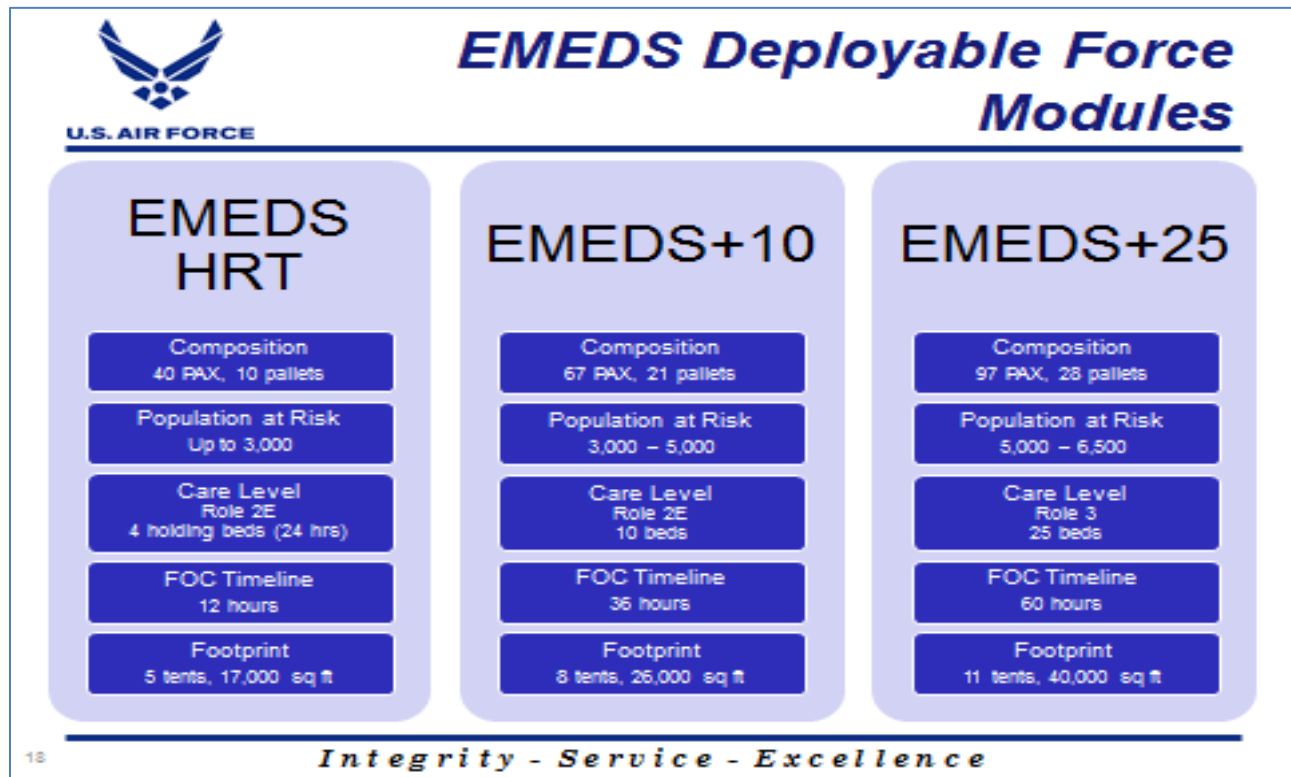


Figure 11. EMEDS Force Module Description³²

In addition to the EMEDS-HRT course, AFI 41-106 requires certain AFSC's to attend C-STARS and Emergency War Surgery Course (EWSC). Some may be eligible for a waiver from C-STARS, but are still required to make every attempt to attend the EWSC. Figure 12 illustrates a formal training course cost breakout factoring every member of the team attending the C-Stars 21 day course.³³

³¹ Ibid.

³² Lt Col Christopher Dun, *Air Combat Command Readiness Responsibilities*, presentation, Air Force Planners Course, Andrews AFB, MD, 9 September 2014.

³³ Ibid.

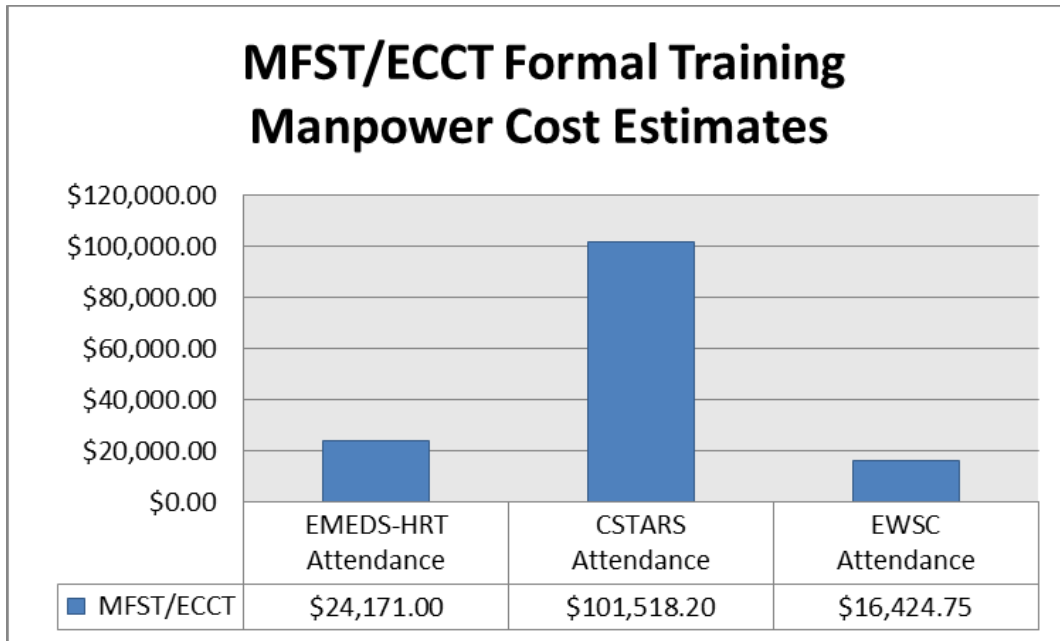


Figure 12. MFST/ECCT Formal Training Manpower Cost Estimates

As with the SOST Venn diagram, the MFST/ECCT diagram (Figure 13) depicts the common MFST/ECCT AFSCs that are shared between all three UTCs (SOST, MFST/ECCT, TCCET).³⁴ This diagram clearly illustrates that there are several LS/HD AFSCs that are common among the different UTCs. Each of the UTCs have different mission sets, but this diagram further illustrates potential efficiencies that may be gained by combining training platforms and equipment assemblages with these capabilities.

³⁴ Ibid.

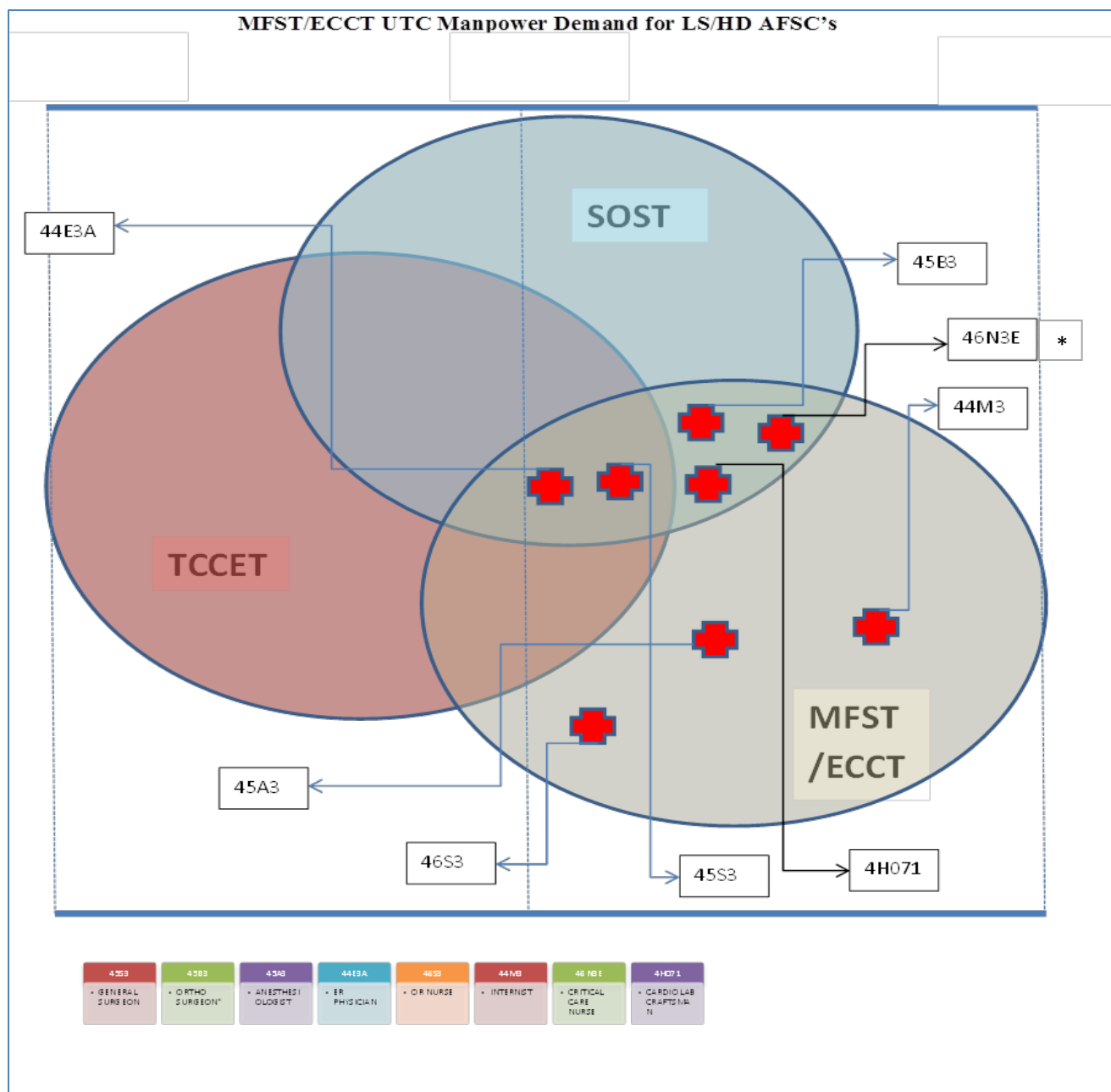


Figure 13. MFST/ECCT UTC Manpower Demand for LS/HD AFSC's
 (* - As of 8 July 2015, the 4N171 has replaced the 46N3E on the MFST MANFOR)

MFST/ECCT - Logistics/Equipment

The MISCAP for both the MFST and ECCT are discussed in further detail below:

MFST MISCAP: “Provides support personnel to establish rapid response resuscitative surgery and emergency medical support personnel at a main operating base, advanced operating

base, bare base, forward operating base or other location forward of established health care support systems. It provides primary disaster medical capability for expeditionary medical support (EMEDS) team, resuscitative trauma surgery, advanced trauma life support (ATLS), and emergency medical care for 10 casualties requiring surgical intervention or for 20 non-operative resuscitations. It usually deploys with UTC FFMF1 (Mobile Field Surgical Equipment) and base operating support (BOS/ECS) is required.”³⁵

MFST’s designated UTC is FFMFS and its associated equipment is designated as UTC FFMF1 (Medical Mobile Field Surgical Team Equipment) with AS of 938G v2. The 938G v2 AS consists of 902 lbs (man-portable field packs) that equal to 0.25 pallet space.³⁶

ECCT MISCAP: “Provides support personnel for forward stabilization and prep of deployed AEF forces for Aeromedical Evacuation (AE). It deploys as part of the EMEDS BASIC/HRT along with UTCs FFMFS, FFMF1, FFEPE, FFPM1/2/4/5, and FFEE7/8 (BASIC), FFEP2/6, FFEE1/4, FFF0C, FFHSR, FFHR1 (HRT) and FFPCM or FFDAB. The team is not a stand-alone capability. It can stabilize/maintain 3 critical patients for 12 hours or provide holding capability for 4 min/intermediate patients for up to 24 hours. There is an assumption that AE support is readily available. ECCT deploys with UTC FFEPE (medical critical care equipment) and BOS/ECS is required.”³⁷

ECCT’s associated equipment is designated as UTC FFEPE (Medical Critical Care Equipment) with AS of 938J v2. The 938J v2 AS consists of 1,436 lbs (man-portable field packs) that equal to approximately 1 pallet space (reference Figure 14).³⁸

³⁵ MEFPAK/LODGET Analysis Tool, accessed 15 February 2015

³⁶ LOGMOD Database

³⁷ MEFPAK/LODGET Analysis Tool, accessed 15 February 2015

³⁸ LOGMOD Database

938G (FFMF1)	938J (FFEPE)
10 surgical intervention pts <i>or</i>	3 critical pts stabilize <i>or</i>
20 non-operative resuscitation	4 intermediate pts
11 sub-assemblages	27 sub-assemblages
585 items (total)	488 items (total)
\$266,154.04 cost	\$221,051.95 cost
902 lbs (6 backpacks)	1436 lbs
.25 pallet	1 pallet

Figure 14. MFST & ECCT AS Overview

If a mission dictates a full MFST team, the merged equipment packages in Figure 15 show the total medical supply, equipment size, weight and cost required for planning considerations.

Merged MFST/ECCT Capability (8 person team)

38 sub-assemblages
1,073 items (total)
\$487,205.99
2338 lbs
1.25 pallets

Figure 15. Total MFST/ECCT Package

The MFST/ECCT essentially is seen as one capability. The supply and equipment bags should be standardized into scalable packaging system where capabilities are built on each other and added depending on the mission requirements. The bags should be organized in a manner that make frequently used items easily accessible and eliminate and shed the unnecessary duplication of like medical supplies/equipment. This will remove unnecessary weight and allow for standardization to one-higher standard in order to fulfill the emerging requirements. The SOST packaging principles should be seen and used as the standard. The pictures in Appendix 1 show vast differences in ease, accessibility, user-friendliness and item choices that contribute to the mission success versus the more complicated set-up.

Tactical Critical Care Evacuation Team (TCCET) / TCCET – Enhanced (TCCET-E) – MRA: AMC

The TCCET is a, “three-person en-route care capability that provides trauma/critical care for en-route damage control resuscitation (DCR)/lifesaving interventions/critical care during pre-hospital evacuation or intra-theater facility transfers”.³⁹ The TCCET-E, “is a two-person, non-standalone en-route care, capability that provides surgical augmentation to the TCCET for enhanced en-route care for up to three critically injured casualties”.⁴⁰ The TCCET and TCCET-E operate closer to the POI and differ from CCATT in the fact that they primarily operate on CASEVAC/MEDEVAC platforms and focus on patients that have not yet been medically or surgically stabilized. The TCCET and TCCET-E training and equipment assemblage requirements are discussed in further detail below.

TCCET – Training Overview

As of March 2015, the required TCCET formal training totaled 83 days, but AMC has recently reduced the required training requirement to 49 days.⁴¹ Figure 16 summarizes the skills required to provide en-route care for critical unstable patients. TCCET is the one conventional medical capability that is most similar to SOST in terms of being trained to provide life-saving care on multiple casualty movement platforms (i.e. CASEVAC, MEDEVAC, AE). Unlike SOST, personnel assigned to TCCET/TCCET-E perform patient care in an MTF versus a SOF medical operational unit whose primary mission is to prepare to deploy and are not assigned to an MTF.

³⁹ Ibid.

⁴⁰ Ibid.

⁴¹ Ibid.

Tactical Critical Care Evacuation Team (TCCET) Formal and Recommended Training Summary		
Course	Description	Duration
Initial Critical Care Aeromedical Transport Team (CCATT) Course	This course provides an introduction to the aeromedical evacuation environment, familiarization training with aeromedical evacuation aircraft, altitude physiology and transport critical care training. ⁴²	14 Days
CCATT Advanced Course*	This course places fully trained military nurses, technicians, and physicians in civilian trauma centers that care for large numbers of trauma and critical care patients. Training is accomplished through hands-on care and lecture in the classroom. ⁴³	14 Days
TCCET Course	This course focuses on the process of stabilization and preparation of critically ill/injured patients for tactical evacuation (TACEVAC) while managing and treating trauma/critically ill patients based on approved national practices and policies. ⁴⁴	7 Days
Center for Sustainment of Trauma and Readiness Skills C-STARS (TCCET-E and TCCSA)	All attendees will attend a 21-day course that offers: -- Trauma lectures -- High Tech Human Simulator Sessions -- Human Cadaver Lab -- Baltimore City Ambulance Rotation -- Trauma Resuscitations in the STC Trauma Resuscitation Unit (TRU), ICU, ER and John's Hopkins Regional burn ICU -- Equipment Skills Stations -- Maryland State Trooper Helicopter rotation (as available) -- Trauma/Critical Care case studies -- Clinical duties as determined by specialty	21 Days
Joint En-route Care Course (JECC)	This course provides the knowledge and skills necessary to manage critical care patients of all demographics during tactical operations on aeromedical rotary wing evacuation platforms, and prepares graduates to recognize and limit the stressors encountered in the transport environment. ⁴⁵	14 Days
Aircraft Critical Care Training (ACCT)*	This course provides critical care training on various aircraft platforms. This requirement is fulfilled by attending the JECC course.	5 Days
Dunker Training*	This course provides Helicopter Overwater Survival Training—prepares aircrew member and their passengers to successfully exit an aircraft in an overwater ditching emergency in both day and night conditions. This requirement is fulfilled by attending the JECC course. ⁴⁶	4 Days
Emergency War Surgery Course (EWSC)*	This course establishes combat trauma training competencies and coordinates training to develop and sustain DoD trauma surgeons whether located in an operational environment, military MTF or at a Level I trauma treatment facility. ⁴⁷	5 Days

⁴² Ibid.

⁴³ Ibid.

⁴⁴ USAF Formal Training, *TCCET Course Announcement*, 2 January 2015, accessed 15 March 2015, <https://etca.randolph.af.mil/default1.asp>

⁴⁵ Ibid.

⁴⁶ US Army Aviation Center of Excellence, *Helicopter Overwater Survival Training*, accessed 15 March 2015, <http://www.rucker.army.mil/newcomers/students/>

⁴⁷ Defense Medical Readiness Training Institute (DMRTI), *EWSC*, accessed 15 March 2015, <http://www.dmrti.army.mil/courses.html>

Evasion and Conduct After Capture (ECAC)*	This course is designed to prepare Air Force members to survive the rigors of isolation and return with honor. The course consists of full spectrum (wartime, peacetime and hostage) captivity training in academic classes and academic role-play laboratory (ARL) training environments. ⁴⁸	6 Days
Combat Airmen Skills Training (CAST)	This course provides combat skills training prior to deploying to the U.S. Central Command area of responsibility.	13 Days
* Recommended Courses		

Figure 16. TCCET Formal Training Summary

TCCET – Manpower Assessment

Figure 17 depicts the TCCET formal training manpower cost estimates for the 9 courses.⁴⁹ What this assessment does not highlight is lost productivity in the MTF or out-of-network care costs for DoD beneficiaries due to the fact that TCCET personnel are assigned within the MTF.

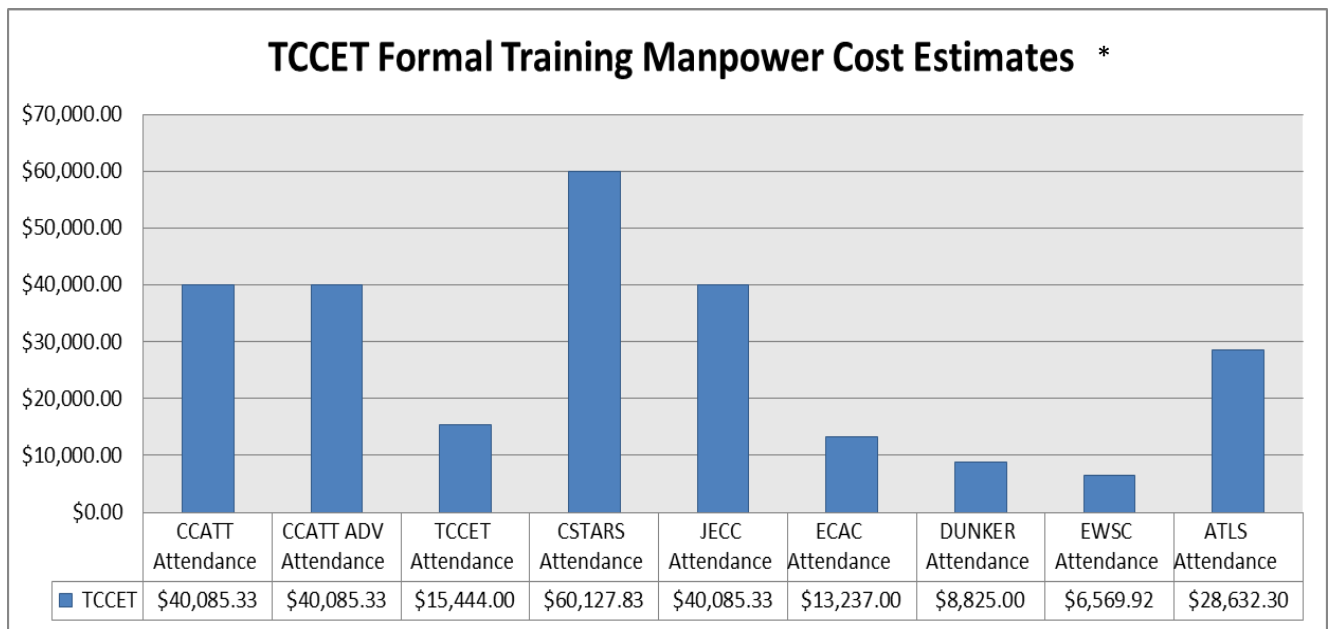


Figure 17. TCCET Formal Training Manpower Cost Estimates

Figure 18 depicts the common LS/HD TCCET AFSCs that are shared between all three UTCs. With the exception of the Clinical Trauma Nurse (046N3J), each TCCET AFSC is shared across the other two UTC's.

⁴⁸ USAF Survival School Factsheet, USAF Website, 19 September 2014, accessed 15 March 2015, <http://www.fairchild.af.mil/library/factsheets/factsheet.asp?id=3771>

⁴⁹ Ibid.

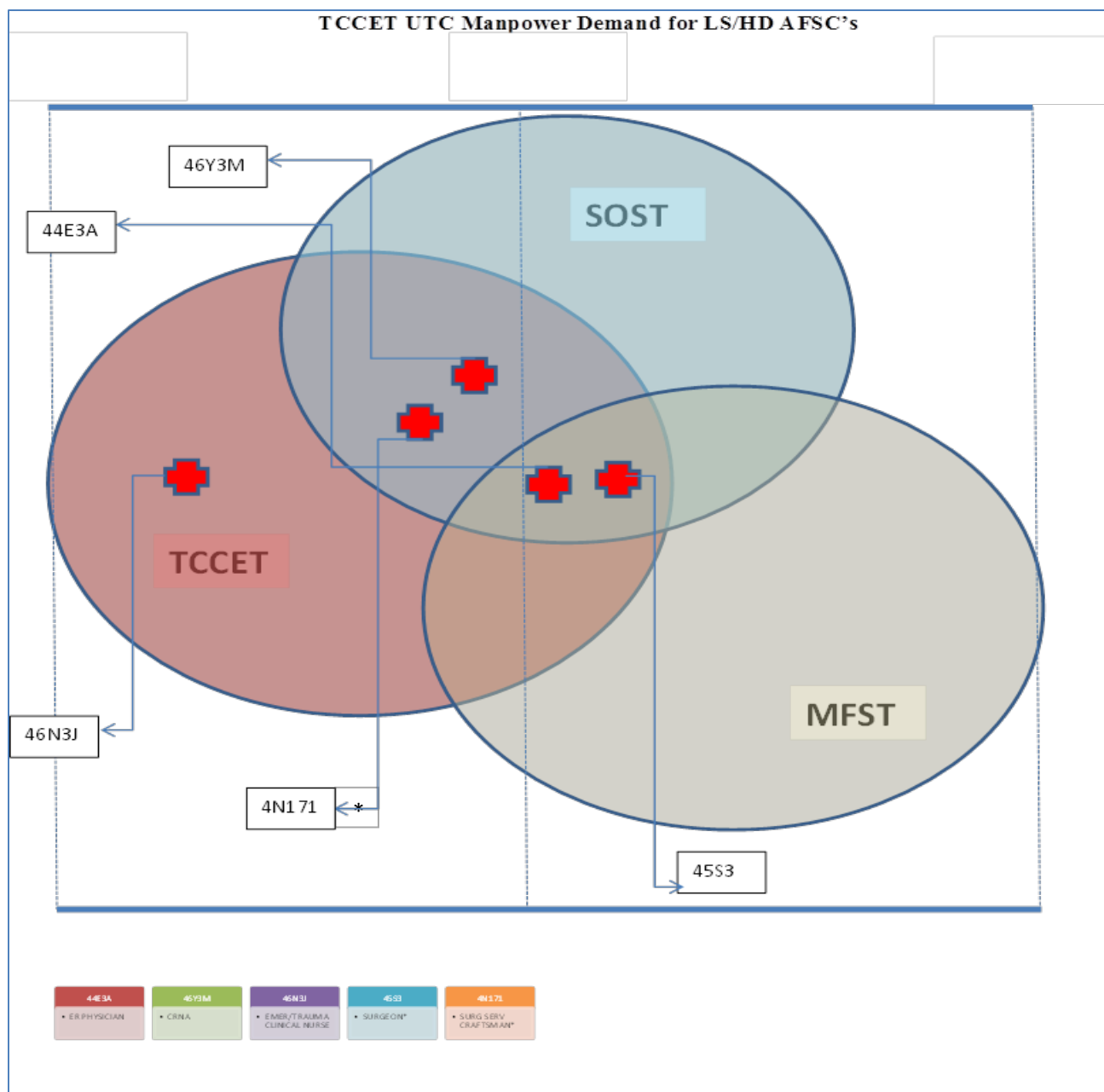


Figure 18. TCCET UTC Manpower Demand for LS/HD AFSC's
 (* - As of 8 July 2015, the 4N171 has replaced the 46N3E on the MFST MANFOR)

TCCET - Logistics/Equipment

The MISCAP for both the TCCET and TCCET-E are discussed in further detail below:

TCCET MISCAP: “Provides trauma/critical care personnel for en-route damage control resuscitation (DCR)/lifesaving interventions/critical care during pre-hospital evacuation or intra-theater facility transfers for up to 3 severely injured/high acuity casualties per mission. This encompasses evacuation from Role 1, including point of injury, and evacuation from Role 2. Team composition may be tailored dependent upon each mission patient/operational requirements. Task FFTC1 (equipment UTC) to provide required patient care supplies.”⁵⁰

TCCET (Tactical Critical Care Evacuation Team) is designated as UTC FFTCT and its associated equipment designated as UTC FFTC1 (Medical Tactical Critical Care Aug) with AS of 887C.⁵¹ The 887C v2 AS consists of 148 lbs in man portable field packs that equal to .0015 pallet space.⁵² Each equipment kit provides single mission support for one patient.⁵³

TCCET can be augmented with TCCSA (Tactical Critical Care Surgical Augmentation) designated as UTC FFTCS. TCCET (personnel and equipment) augments TCCSA (FFTCS) to create a TCCET-E (Tactical Critical Care Evacuation Team – Enhanced).⁵⁴

The AS of 887S v2 consists of 70 lbs in man-portable field packs that equal to .015 pallet space.⁵⁵ Besides 887S v2 AS, another equipment package can be added to TCCSA, designated as UTC FFTC3 (Tactical Critical Care Evacuation Surgical Augmentation Resupply) with AS of 887T v2. “It provides additional specialty medical equipment to resupply the FFTCS UTC in order to perform up to four additional damage control surgical procedures.”⁵⁶ FFTC3 with AS of

⁵⁰ MEFPAK/LODGET Analysis Tool, accessed 15 February 2015

⁵¹ AFTTP 3-42.58, *Draft Tactical Critical Care Evacuation Team*, 22 January 2015

⁵² <https://medlog.us.af.mil/index.cfm>

⁵³ MEFPAK/LODGET Analysis Tool, accessed 15 February 2015

⁵⁴ AFTTP 3-42.58, *Draft Tactical Critical Care Evacuation Team*, 22 January 2015

⁵⁵ <https://medlog.us.af.mil/index.cfm>

⁵⁶ AFTTP 3-42.58, *Draft Tactical Critical Care Evacuation Team*, 22 January 2015

887T v2 (Tactical Critical Care Evacuation Team Ext Aug v1) consists of 70 lbs in man-portable field packs that equal to .015 pallet space.⁵⁷ Figure 19 provides a quick synopsis of the discussed weight, size and cost. The provided weight for these packages could not be verified in LOGMOD, thus is presented as an approximation.

Quick Synopsis of TCCET & TCCSA Teams

TCCET (3 person team)	TCCSA (2 person team)	
3 critical patients (DCR)	3 DCS procedures	4 DCS procedures
12 sub-assemblages	9 sub-assemblages	1 sub-assemblage
679 items	572 items	75 items
\$416,777.40 cost	\$149,573.00 cost	\$15,100.71 cost
148* lbs (man portable backpacks)	70* lbs	70* lbs
.0015* pallet	.0015 pallet	.0015 pallet

Figure 19. TCCET & TCCSA Equipment (*Approximation)

If a mission dictates for TCCET-E capability, the merged equipment packages in Figure 20 show the total medical supply/equipment size and approximated weight required for planning purposes.

Merged TCCET/TCCSA = TCCET-E Capability (5 person team)

22 sub-assemblages
1326 items
\$581,451.11
288* lbs
.0045* pallets

Figure 20. TCCET-E Equipment (*Approximation)

⁵⁷ <https://medlog.us.af.mil/index.cfm>

Logistics Summary: MFST, TCCET, SOST & ECCT, TCCSA, SOST equipment packages

A quick summary of MFST, TCCET, SOST and ECCT, TCCSA, SOST equipment packages have been provided in Figure 21 and Figure 22 accordingly⁵⁸:

Summary of MFST, TCCET, SOST

11 sub-assemblages	12 sub-assemblages	42 sub-assemblages
585 items	679 items	2236 items
\$266,154.04 cost	\$416,777.40 cost	\$502,619.80 cost
902 lbs	148 lbs*	2739 lbs
.25 pallet	.0015 pallet*	1.5 pallets*

Figure 21. MFST, TCCET, SOST Equipment (*Approximation)

Summary of ECCT, TCCSA, SOST (Surgical)

27 sub-assemblages	10 sub-assemblages	23 sub-assemblages
488 items	647 items	1535 items
\$221,051.95 cost	\$164,673.71 cost	\$276,580.29 cost
1436 lbs	140 lbs*	2269 lbs
1 pallet	.0030 pallet*	1 pallet*

Figure 22. ECCT, TCCSA, SOST (surgical) Equipment

There are few important points that need to be made: First, overall these mission sets have the same goal – to provide care to the injured person on the ground, in the air or somewhere in between. Also, the emerging requirement of providing care with one capability instead of slicing the care into pieces, should be considered. MFST, TCCET and SOST AS, the same as, ECCT, TCCSA and SOST (surgical) AS, should be built to 90% of the same items. In general, the medics use identical tools for similar procedures, but the differences in cost, weight, item count and space that drastically varies among these equipment/supply packages is quite surprising. The goal should be for these similar missions to have interchangeable, modular, low-deviation equipment/supply packages. Second, the similar UTC equipment packages should make it easier and be user-friendly for any medic to know immediately where items are located

⁵⁸ Ibid.

in order to provide the best care, no matter what the mission. Same packages can assist with the required training to get the medics ready for any of the given missions. Third, the assumption before the research of the three like UTC capabilities was that SOST sets the bar for the higher level standard that should be emulated by others. It was surprising to see that SOST equipment packages are the heaviest, largest and hold the most items. It is important to point out that the cost directly correlates to the item choices, packaging and flexibility of the equipment packages. These packages have items that the other two capabilities don't have, but should. Still, the assumption stands strong that other capabilities with similar mission sets should emulate SOST equipment packages. Below is a quick summary comparison of these UTC equipment packages:

MFST + ECCT; TCCET + TCCSA=TCCET-E; SOST & SOST Surgical		
38 sub-assemblages	22 sub-assemblages	65 sub-assemblages
1073 items	1326 items	3771 items
\$487,205.99	\$581,451.11 cost	\$779,200.09 cost
2338 lbs	288 lbs*	5008 lbs
1.25 pallet	.0045* pallet	2.5 pallets*

Figure 23. Three like UTC Equipment Packages

UTC COMPARISON

Manpower/Training Comparison - MFST/ECCT, TCCET, and SOST UTC's

Figure 24 is a breakout of the SOST, MFST/ECCT, TCCET, and SOST UTC's currently listed on the MRL.⁵⁹ It is important to note that Guard/Reserve account for more than 50 percent of the MFST and 61 percent of ECCT—current mobilization restrictions is a factor that must be considered when discussing COAs to enhance these team's capabilities. Figure 25 shows the

⁵⁹ Ibid.

Active Duty training manpower cost per team, and Figure 26 illustrates the total training costs for each of the capabilities (MFST/ECCT, TCCET, and SOST).⁶⁰

Active Duty and Air Reserve Component UTC Breakout

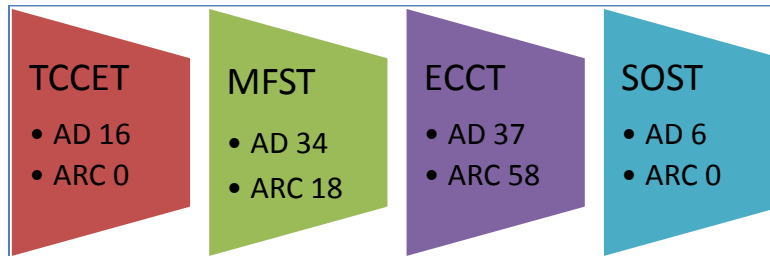


Figure 24. Active Duty and Air Reserve Component UTC Breakout

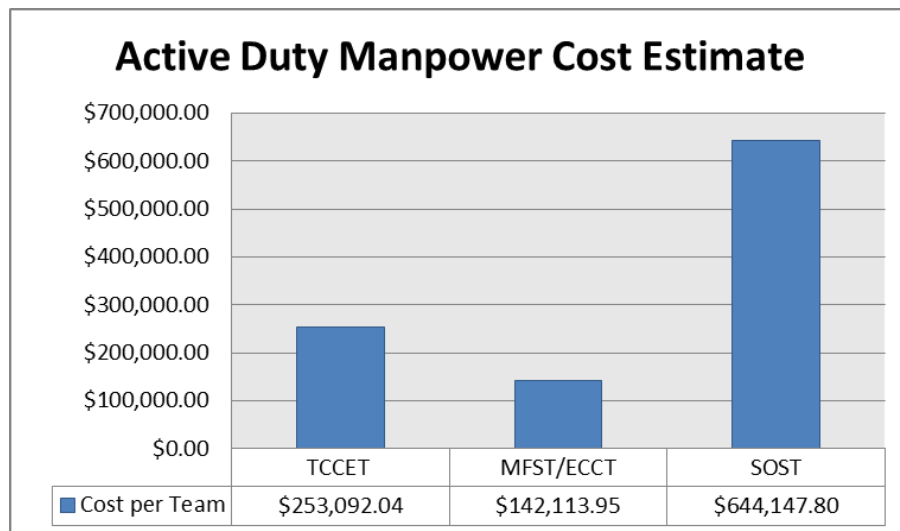


Figure 25. Active Duty Manpower Cost Estimate

⁶⁰ Ibid.

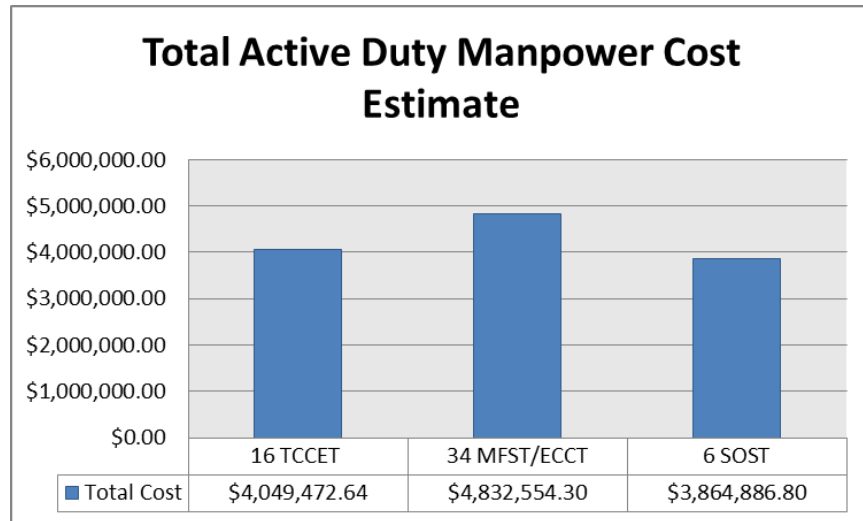


Figure 26. Total Active Duty Manpower Cost Estimate

Equipment Comparison - MFST/ECCT, TCCET-E, and SOST UTC's

A comparison with \$1,000 equipment and supply value differential among the following equipment packages was performed: MFST (FFMFS) & TCCET-E (FFTCT & FFTCS). Both UTCs have 5 member teams and according to AMC/ACC MEFPKs, should have the closest equipment resemblance. This translated to comparison of AS 938G v2 with AS 887C, 887S and 887T. The results showed the following differences, from MFST 584 items versus TCCET-E 1,326 items, the delta of \$1K equipment, supply expense for MFST equaled to \$91K and for TCCET-E equaled to \$55K. The described capabilities for both teams in the MISCAP are similar enough, where there shouldn't be such a drastic difference among the equipment packages. Figure 27 provides a summary of what it would cost to bring the MFST equipment UTC up to TCCET-E level or incorporate the entire MFST AS into the TCCET-E UTC.

MFST (584 total items)	TCCET-E (1,326 total items)
Not in MFST = \$91,556.30	Not in TCCET-E = \$55,169.68
Examples: laryngoscope set video assist, blood fluid warmer, communication kit – aircraft etc.	Examples: generator, oxygen monitor etc.

Figure 27. MFST & TCCET-E Comparison

The next comparison was performed with MFST (FFMFS) & SOST (FFQE3) equipment packages, both according to ACC and AFSOC MEFPKs, should have the closest equipment resemblance. This translated to comparison of AS 938G v2 with AS 912C, 912D and 912M. The results displayed the following differences, from MFST 584 items versus SOST (FFQE3) 2,236 items, the delta of \$1K equipment and supply expense for MFST equaled to \$125K and for SOST \$16K. From the MISCAP and equipment package descriptions, there should be fewer differences and more similarities among the packages, especially, for MFST. There are items that should be added to MFST or adjusted in order to take up less space and to provide better life-saving items for the injured person. As seen in the Figure 28, SOST had most of the MFST items.⁶¹

MFST (584 items)	SOST (2,236 items)
Not in MFST = \$125,700.84 (21 items)	Not in SOST = \$16,206.04 (4 items)
Examples: table, blood warmer, sterilizer, freezer blood plasma, hypothermia warming blanket etc.	Examples: generator, oxygen monitor etc.

Figure 28. MFST & SOST Comparison

OPERATIONAL CHALLENGES

Current Challenges – Capability Development

Over the last 12 years, conventional ground and en-route medical capabilities discussed above have been largely effective due to a large medical footprint (i.e. Balad [Iraq], Bagram [Afghanistan]), robust en-route casualty evacuation system and robust logistical reach-back support. The current operational challenges associated with conventional medical capabilities, like EMEDS HRT(MFST/ECCT) are highlighted when the three elements discussed above are not readily available. In several austere regions of the world there are ongoing operations where

⁶¹ Ibid.

conventional EMEDS HRT (MFST/ECCT) medical capabilities would be more effective if they were organized, trained, and equipped to be able to provide clinical and surgical resuscitative care on all casualty movement platforms (CASEVAC, MEDEVAC, AE) with one team.

Conventional medical capabilities have the ability to conduct these missions with multiple UTCs but the increased UTC and logistical footprint creates a challenge when only a small flexible and agile capability is needed.

Current Challenges – Training

Relative Value Unit (RVU) priorities, surgical case-mix and trauma level case workload place significant operational challenges relating to Surgeons and Critical Care providers maintaining clinical currency. These challenges hamper the ability of both critical care and surgical providers to maintain the necessary skill to operate in austere environments where establishing a large medical footprint and establishing a robust evacuation system may not be possible. *The Report of the Military Compensation and Retirement Modernization Commission* (MCRMC) was recently released, and lists several of these readiness training challenges⁶²:

- Relative Value Unit (RVU)⁶³ Priorities – MTFs develop their budgetary program and business plan base on RVUs, but the report noted that RVUs do not directly measure the suitability of medical cases for maintaining the military readiness of the medical force.
- Case-Mix – The current clinical case-mix in inpatient facilities do not support the necessary readiness training skill-set required to support operational missions. In 2013, 8 of the top 10 operations performed in military inpatient facilities was unrelated to anything providers would see in a trauma type environment. Most providers must attend a trauma level course like Air Force Centers for Sustainment of Trauma and Readiness Skills (C-STARS) to receive any type of appropriate pre-deployment training.
- Trauma Case Workload – “DoD recently completed the first phase of its MHS Modernization Study, which compared the volume of health care performed by physicians in military hospitals and clinics to that of civilian physicians. The study presented data on military physician work RVU volume compared to civilian physician work RVU volume. For example, the study shows that military medical personnel in San Diego, California

⁶² Report of the Military Compensation and Retirement Modernization Commission, Final report, January 2015

⁶³ *DOD Dictionary of Military Terms*, http://www.dtic.mil/doctrine/dod_dictionary/ [accessed 9 March 2015].

perform as many general surgery procedures as 5 percent of civilian surgeons; the other 95 percent of civilian surgeons do more procedures each year and in San Antonio military orthopedic surgeons perform as many procedures as 7 percent of civilian orthopedic surgeons”.

Many of the current readiness training challenges are associated with the lack of trauma level cases outside of formal training opportunities like C-Stars. One way to combat this issue would be to adopt the medical SOF framework by assigning members, attached to medical conventional UTCs (MFST/ECCT), outside of the MTF. There are current examples, like the Air Force MTF in MacDill AFB, Florida, where an External Resource Sharing Agreement (ERSA) has been established to provide readiness skills sustainment outside of the MTF for general and orthopedic surgeons. Examining this example a little bit further will provide insight into how working outside of the traditional MTF can provide a medical-ready force and provide workload benefit to the Air Force as well.

The 6th Medical Group out of MacDill AFB, Florida has an established ERSA with Tampa General Hospital (Tampa, Florida) for their general/orthopedic surgeons to operate on both civilian patients and DoD beneficiaries. The MacDill AFB Tricare Prime Service Area (Active Duty, Active Duty Dependents and Retirees) is about 140 thousand beneficiaries with the Air Force being the only military service in this area.⁶⁴ In 2014, general and orthopedic surgeons operating out of Tampa General generated an average 21 RVUs (\$11K) per month.⁶⁵ This example illustrates how operational training challenges can be mitigated by leveraging civilian training to maintain the necessary trauma training skills while still providing value to the government.

⁶⁴ 2014 ERSA Workload Data, this data was accessed from a Microsoft Excel database on 10 April 2015.

⁶⁵ Ibid.

Current Challenges - Requests for Capabilities

Combatant Commands (e.g. CENTCOM and AFRICOM) are beginning to request conventional medical capabilities (e.g. MFST/ECCT) to perform both conventional and non-conventional mission sets outside the scope of their training. In the CENTCOM AOR, conventional MFST/ECCTs are operating outside of traditional doctrinal roles by providing direct support to SOF units. These are UTCs are having to go through additional AdHoc training outside of their UTC training platform in order to perform the mission. This illustrates how utilizing UTCs outside of their designated mission capabilities creates significant operational challenges for both the deployed personnel and the MRAs.

Current Challenges – Equipment Assemblages

Equipment familiarization and packaging present significant operational challenges for medical capabilities operating in a non-conventional environment. For example, In the CENTCOM AOR, many on the MFST/ECCT teams had never seen the equipment they were expected to forward deploy with. Members on these teams had been deployed before, some as CCATT some as EMEDS, some as Flight Nurses/Doctors, still none were familiar with the equipment—these teams have a steep learning curve to not only discover what was in their equipment packages, but also to re-package the equipment and supplies in a manner that would optimize the delivery of care. This example further highlights the need for personnel to be familiar with their equipment especially when operating in support of non-conventional forces.

Future Challenges

In 2013, President Obama pointed a shift to the pacific theater. He stated: “It was clear that there was an imbalance in the projection and focus of U.S. power,” the president deemed U.S. military power to be over-weighted in the Middle East, yet under-weighted in regions such

as the Asia-Pacific.⁶⁶ This shift could bring new requirements for military projection of power and therefore needed medical capability into an area that is vastly larger and more complicated than the CENTCOM AOR.

In 2014, the PACAF CBA was developed in an effort to identify specific capability gaps in providing medical care in an *Air-Sea Battle* (ASB), A2/AD environment—ASB, “describes integrated operations across all five domains, air, land, sea, space and cyberspace, to create an advantage.” One mission critical capability gap identified as a result of this study was the ability of the Air Force to provide “medical standards of care” in an ASB, A2/AD environment.⁶⁷

USAF lacks the ability to provide standard of care at dispersed and main operating locations in an A2AD environment during an ASB scenario. Specifically, the USAF is unable to employ the optimal capability when and where needed as expected to meet the “golden hour” requirement and hold patients until movement is available, stabilize and treat during transport, and provide effective, integrated HSS across service lines.

This critical capability gap will be explained in further detail as doctrinal concepts in the *Medical Operations in a Denied Environment Concept of Operations* (MODE CONOPS) are discussed.

As discussed earlier, the US military’s ability to dominant the air domain has promoted the use of a deliberate linear patient evacuation system where the patient can easily be transported between Medical Roles of Care. In the future, new adversaries coupled with advances in technology will enhance the enemy’s capability to disrupt military operations and hamper our ability to execute our current system.⁶⁸

While operational access itself is not new, some of the conditions under which joint forces will operate to gain it in the future are. The Joint Operating Environment 2010-

⁶⁶ Lyle, A. Armed Forces Press Service, 2013, accessed 1 April 2015, <http://www.defense.gov/news/newsarticle.aspx?id=119505>

⁶⁷ PACAF CBA Document, PACAF/SGR, Mar 2014

⁶⁸ Medical Operations in Denied Environments, *Draft CONOPS*, *Undated*

11 envisions a future characterized by complexity, uncertainty, and rapid change, all of which will influence future joint operational access. In addition, three particular trends in the operating environment promise to complicate the challenge of opposed access for U.S. joint forces: (1) the dramatic improvement and proliferation of weapons and other technologies capable of denying access to or freedom of action within an operational area, (2) changing U.S. overseas defense posture, and (3) the emergence of space and cyberspace as increasingly important and contested domains.

The *MODE CONOPS* presents several doctrinal concepts that highlight critical capability gaps in our current patient evacuation system to support operations in a denied environment.

Flex Care System

Unlike today's operational environment, providing medical support in a denied environment will require medical capabilities to be broken down into smaller capability sets and dispersed over longer distances—this will require a medical support and patient evacuations system that can surge to meet requirements. The *Flex Care* system is defined as, “a system that uses multiple overlapping capabilities or combination of capabilities so that if one capability is insufficient, fails or can't be employed the other options remain available to continue the stabilization, treatment and evacuation mission. It seeks the most efficient route available to rapidly stabilize and evacuate casualties inside a threat area to a safe haven outside the threat regions.”⁶⁹ This concept is visually depicted below in Figure 29 below.⁷⁰

⁶⁹ Ibid.

⁷⁰ Ibid.

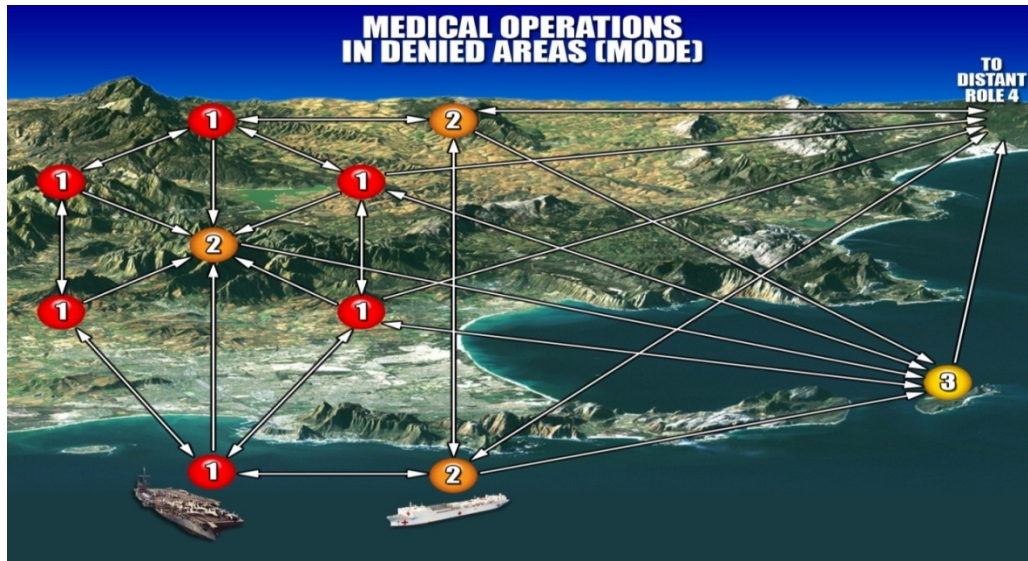


Figure 29. Flex Care System in MODE

The *Flex Care System* incorporates the following capabilities to ensure it can meet the surge requirement.⁷¹

Point-of-injury medics - small medical elements traditionally focused on primary care and limited emergency medicine are trained with increased emphasis on emergency medicine to stabilize casualties with kinetic weapons injuries.

Push-pull medical reinforcement - Networked, integrated, flex care C2 provides the battle space awareness to enable push-pull medical support to units requiring medical surge support. Small medical units would have capability to request, or pull, medical reinforcements.

Reinforcing medical teams - Medical reinforcements may be prepositioned at designated locations, with regional support responsibility, reducing the collective footprint of direct support medics in theater while preserving the ability to surge within a planned response time.

Evacuation Platform - Enhanced utilization of non-traditional evacuation/treatment platforms and non-traditional use of current evacuation platforms.

Evacuation between equivalent echelons of care - In mass casualty events, medical resources at the target base are expected to be insufficient. Evacuations would be expected to occur between facilities with comparable capabilities (i.e., originate from a “Role 2” facility and proceed to other “Role 2” facilities in order to advance the time to required treatment by utilizing less stressed medical resources. In addition, robust evacuation platforms with capabilities like Tactical Critical Care Evacuation Team – Enhanced (Surgical) provide En-route ER and surgical care and therefore could function as a flying “Role 2” MTF.

⁷¹ Ibid.

Medical Capability Signal Demand

In future conflicts evacuation capabilities may be unavailable or only available during a limited window which would overwhelm current Air Force ground medical capabilities that are in existence today. In order to understand what the signal demand may be during an A2/AD event, RAND conducted a notional missile simulation on a notional base utilizing existing Air Force EMEDS+10 capability. In Figure 30, the top two tables represent a summary of the EMEDS capabilities (top left) and a notional A2/AD missile attack strategy (top right) showing a combination of the types of missiles that may be used in an attack—the bottom table summarizes the medical impact given the notional attack strategy for “Base 2”.⁷²

⁷² Brent Thomas and Sarah Nowak, “*Supporting Medical Operations in Denied Environments (MODE)*”, presentation, AF/SG Nursing Symposium, Falls Church, VA, 27 January 2015.

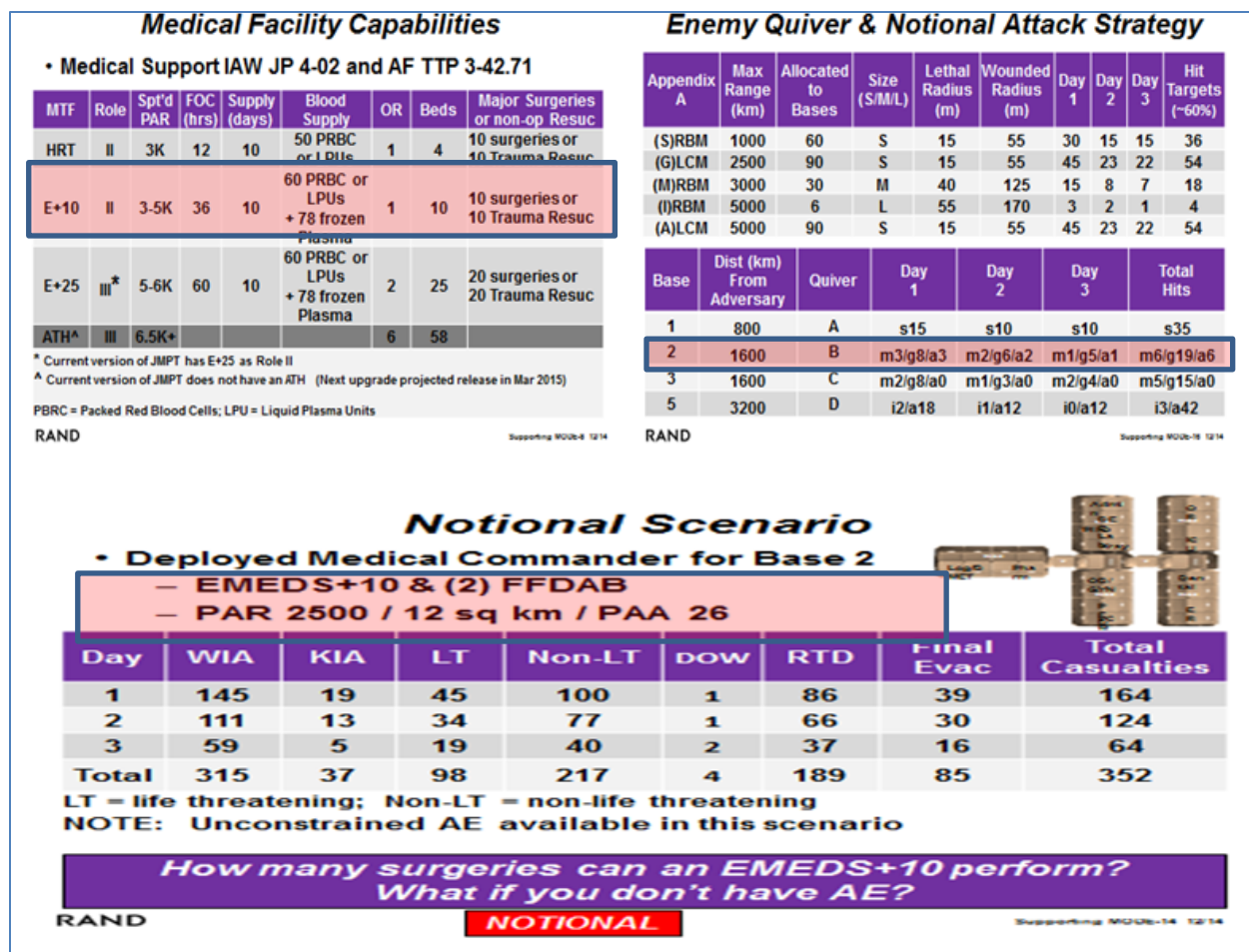


Figure 30. Notional A2/AD Scenario

Figure 30 clearly illustrates that the current EMEDS+10 capability quickly becomes overwhelmed by day 1—there are insufficient surgical capability, limited blood resources, not enough holding beds and the entire 10 day supply would be insufficient for the number of casualties that are presenting. This scenario was actually based on unlimited availability of AE assets, so it is very easy to see how the KIA numbers could dramatically increase if the critical patients were unable to be evacuated to a higher level of care. In this instance, the current patient holding capability is unable to meet this type of demand signal without adding a more robust capability (i.e. Air Force Theater Hospitals [AFTH]), and creating a larger footprint. This notional example illustrates of the challenges relating to patient evacuation, patient holding, and logistical pre-position/reach-back capabilities.

Consolidation and Evacuation

As seen from the notional example above, utilizing the current linear patient evacuation system might not be executable. MODE places an emphasis on consolidation versus patient staging.⁷³

The MODE CONOPS replaces staging with consolidation, when and where required. This transition is necessary due to the inability of medical assets to persist in one specific location for an extended period of time. Consolidation of patients, as opposed to staging patients, introduces increasingly complex timing and synchronicity of patient movement. Although consolidation and evacuation adds complexity, it has the capacity to dramatically reduce kinetic risk to medical personnel and patients. Thus, increasing casualty survivability by decreasing the amount of time forces are massed in one location.

The Current Joint C2 structure, where different services have proprietary control over casualty movement platforms (MEDEVAC-Army, AE-Air Force), does not support the ability to effectively “consolidate” and “evacuate” patient in this type of scenario. The *Joint Concept for Entry Operations* suggests that, “interoperability of Service and allied C2 systems allows rapid expansion and synchronization of joint and combined forces’ C2 for specific mission requirements.”⁷⁴

COURSES OF ACTION

Currently, MFST/TCCET-E, ECCT/TCCET, and SOST draw from the same pool of LS/HD AFSCs, yet the training platforms and doctrinal missions for these different UTCs are vastly different. MFST/ECCT and TCCET/TCCET-E UTCs are not currently organized, trained and equipped to meet the increasing signal demand for SOF or non-conventional support. As military operations continue expand into new and uncharted territory, our delivery of medical care will have to evolve. The COAs presented below provide a broad framework for mitigating

⁷³ Ibid.

⁷⁴ Joint Concept for Entry Operations, April 2014

the operational challenges identified above, and provide recommended COAs that will enable these capabilities to meet today's mission while preparing for tomorrow's war.

The three COAs are: (1) Train the MFST/ECCT and TCCET/TCCET-E to enable both conventional and non-conventional (i.e. SOST) support; (2) Combine the current MFST/ECCT, TCCET/TCCET-E, and SOST equipment UTCs into a building block critical care and surgical equipment assemblage that can support both conventional and non-conventional missions; (3) Combine the MFST/ECCT, TCCET/TCCET-E, and SOST UTCS into one tailorable capability that can perform the mission of all three MRAs. The following factors were considered in developing these COAs: training platforms, shared LS/HD AFSCs, shared equipment supply items, emerging requests for capabilities, and future capability requirements. The overarching goals of these different COAs was to gain efficiencies through the use of standardized training platforms and equipment assemblages, and provide flexibility where one capability has the ability to meet different mission requirements by leveraging multiple casualty movement platforms. Each COA could be implemented independently or combined as seen in COA number three.

COA#1 - Train the MFST/ECCT, and TCCET/TCCET-E to provide both flexible conventional and non-conventional support

Currently there is a wide training requirement gap between MFST/ECCT, TCCET/TCCET-E and SOST. A baseline training platform needs to be established that achieves two goals: provides compatibility between MFST/ECCT and TCCET/TCCET-E, and train these UTCs to provide non-conventional (i.e. SOF) support. When comparing the training requirements for MFST/TCCET-E and ECCT/TCCET, the minimum training baseline should be established to enable compatibility between the UTCs. MFST/ECCT personnel should attend the necessary level of training to provide a TCCET level response and TCCET/TCCET-E

personnel should attend EMEDS HRT course to enable these members to potentially conduct TCCET missions while operating out of an EMEDS platform.

This standardized training platform should also enable non-conventional support. The SOST training platform should be utilized as the framework to determine the minimal level of training required for conventional UTCs to support SOF missions. Establishing a training baseline across all three of these capabilities would provide a more flexible capability that would be better suited to meet emerging and future requirements. This COA provides the flexibility for combatant commands to potentially flex one capability to meet multiple mission requirements where a large medical footprint is not feasible and SOF support is not available.

COA#2 – Eliminate equipment redundancies across UTCs by developing a standardized building block critical care and surgical AS that provide conventional and non-conventional support

Currently MFST/ECCT, TCCET/TCET-E, and SOST all are comprised of common AFSCs, but have different equipment sets that are sourced and funded through three separate MRAs. The two overarching goals for this COA are: eliminate equipment/supply redundancies across all UTCs, and better enable conventional UTCs to provide non-conventional support. All three MRAs (AMC, ACC, and AFSOC) should review the current equipment UTC ASs and develop a standardized critical care and surgical AS building-block capability that can be used to support the entire range of conventional and non-conventional military operations. The building-block framework would focus on standardizing all critical care and surgical supply/equipment items across all three MRAs and would then tailor the different UTC packages based upon the mission requirements (conventional vs. SOF), and required medical lay-down (traditional EMEDS footprint vs. small agile force). Developing standardized equipment sets would enable conventional and non-conventional capabilities to utilize the same equipment regardless of the type of environment they are operating in.

COA#3 – Combine MFST/ECCT, TCCET/TCCET-E, and SOST UTCs

The third COA mirrors the SOST UTC framework (combining surgical and critical care capability) in the development of one combined UTC. Combining the MFST/ECCT, TCCET/TCCET-E, and SOST UTCs incorporates both COA 1 and COA2 by standardizing the training, equipment, and manpower for all the teams. All team members will be trained on one UTC platform ensuring a ready force that can utilize multiple casualty movement platforms and meet the signal demand regardless of the capability requirements. Combatant Commanders would still retain current Operational Control (OPCON) over all their allocated forces, but a combined critical care and surgical capability provides the needed flexibility for the medical planners when developing requests for capability.

With fewer UTCs, another potential benefit of combining multiple capabilities would be the ability to potentially mold existing ERSAs (like the MacDill AFB example discussed above) and the new C-Stars Sustained Medical and Readiness Training (SMART) program after the current SOST sustainment training platform. The SOST sustainment training platform provides consistent training for all personnel assigned to these teams to ensure they are deployment ready in a moment's notice. Emulating the SOST training framework would allow the team members to work and train together outside of the MTF, which would potentially mitigate some of the training challenges discussed above (i.e. RVU priorities, case-mix, trauma case workload). Utilizing these programs in this manner could increase team cohesion and trust which enables teams to perform at a high level during deployments.

COA Comparison and Recommendation

There are distinct advantages and disadvantages with each of these COAs. With COA One, standardizing the training platform across these different medical capabilities provides flexibility to the Combatant Commands but may present challenges as it relates to being able to

tailor equipment packages to changing mission requirements. In COA Two, standardizing only the equipment assemblages across these capabilities would enhance equipment familiarization and tailoring, but does not address the flexibility issues relating to one team being able to conduct different mission-sets. COA Three allows the MRAs to gain efficiencies by leveraging critical HD/LS AFSCs, developing standardized training and equipment platforms, and streamlining the War Reserve Material programming process.

All of the COAs have benefits, all will cost money and time, but this investment is one that we have to make to ensure our ability to meet emerging and future requirements. COA 3 is the recommended option that provides the greatest efficiency and flexibility. The demand for a highly trained, scalable and cohesive UTC that can perform in any environment is already upon us. The AFMS needs to develop one small agile capability that can flex to meet ever-changing mission requirements.

Conclusion

The ultimate goal of this paper was to ignite a discussion between MRAs for a more casualty driven and focused initiative for future capability development. The current en-route care systems has been very effective over the last 14 years of war, but as we draw down in these areas and new conflicts start to emerge in austere environments, the UTC capabilities need to evolve to meet the changing signal demand now and in the future. Medical assets should be trained and equipped to deploy, capable in their roles, and report to their CDR's ready to treat the very next casualty. Comparing the different capabilities (MFST/ECCT, TCCET/TCCET-E, SOST UTC's) provided insight into the operational challenges that are present today and the development of COAS that address these challenges.

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OFFICE OF THE AIR FORCE SURGEON GENERAL

FELLOWSHIP PAPER

APPENDIX



By:

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Daniel T. Townsend, Maj, USAF, MSC
Ramona S. Daugherty, Capt, USAF, MSC
Scott A. Baker, Capt, USAF, MSC

A Research Report Submitted to HQ AF/SG35X

In Partial Fulfillment of the Fellowship Requirements

Defense Health Headquarters, Falls Church, VA

April 2015

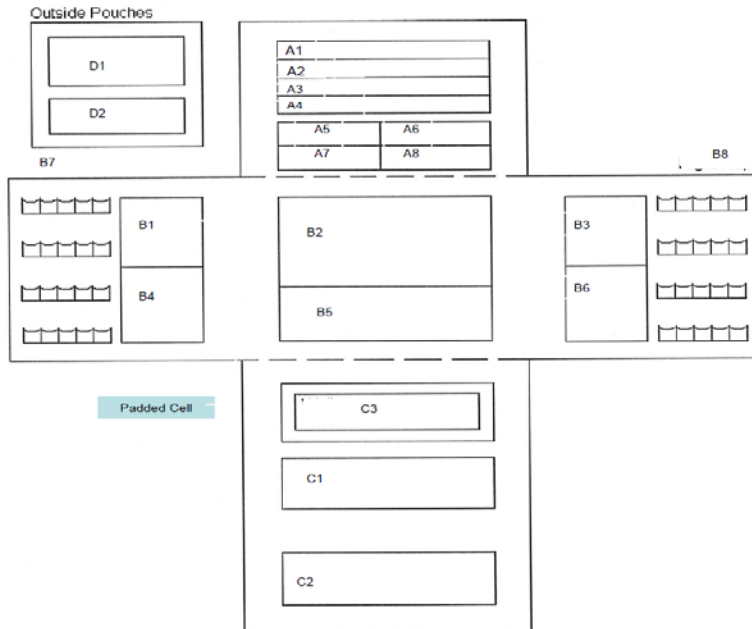
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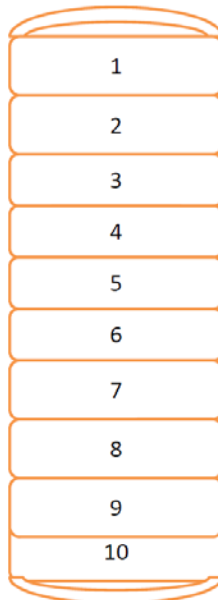
MFST & ECCT Capability Allowance Standards					
938G v2 AS (Sub-Assemblage)	Item Count	Cost	938J v2 AS (Sub-Assemblage)	Item Count	Cost
AA – Anesthesia Element	115	\$12,002.65	AA – Medication Bag	45	\$4,529.54
AB – Anesthesia Element Roll Bag	34	\$895.27	BA – Procedure Bag	34	\$3,385.11
BA – Emergency Medicine Element	62	\$9,081.23	BB - Procedure Bag Roll A	13	\$533.42
BB – Emergency Medicine Element Roll Bag	40	\$1,705.06	BC – Procedure Bag Roll B	27	\$2,917.86
CA – General Surgery Element	100	\$29,108.63	CA – Miscellaneous	29	\$2,369.68
CB – general Surgery Element Roll Bag	15	\$3,452.15	CB – Miscellaneous Bag Roll A	16	\$532.41
DA – OR Element	82	\$15,040.13	CC – Miscellaneous Bag Roll B	20	\$2,631.57
DB – OR Element Roll Bag	25	\$3,975.11	DA – IV Supplies/Access	26	\$4,373.96
EA – Orthopedic Surgery Element	50	\$73,917.09	DB – IV Supplies/Access/Roll A	13	\$598.72
FA – Supplemental Medical Bag	15	\$37,603.62	DC – IV Supplies/Access/ Roll B	16	\$459.40
FB – Ultrasound Bag	7	\$60,778.83	EA – Bandage/Dressing	22	\$1,741.47
GA – Supplemental Non-Medical Bag	15	\$2,372.22	FA – Burn Trauma Patient Setup 1	17	\$42,875.12
HA – Narcotics Case – Hand Carry	5	\$352.11	GA – Burn Trauma Patient Setup 2	17	\$42,874.60
IA – Litters and Sinks	8	\$4,307.76	HA – Burn Trauma Patient Setup 3	17	\$42,890.55
JA – Blood Analyzer Bag	5	\$10,976.35	IA – Airway Support	34	\$4,596.54
KA – Refrigerated Items – Hand Carry	6	\$548.27	JA – I Stat, Mechanics Bag	15	\$11,761.40
Total Item Count	584		JB – Laryngoscope	26	\$727.38
Total Critical Cost		\$158,430.41	KA – IV Field	15	\$4,060.56
Total Non-Critical Cost		\$107,686.08	LA – Ward Supply	8	\$928.77
Total Allowance Standard Cost		\$266,116.49	MA – Ward Supply W/Oxygen Concentrator A	14	\$6,174.91
			NA – Administration Bag	29	\$2,069.33
			OA – Oxygen Concentrator & Biosupplies A	10	\$4,599.19
			PA – Oxygen Concentrator Biosupplies B	8	\$4,737.66
			QA – Defibrillator	4	\$21,798.91
			RA – Computer Bag	2	\$3,216.52
			SA – Narcotics Bag	7	\$500.83
			TA - Litters	4	\$3,166.55
			Total Item Count	488	
			Total Critical Cost		\$132,994.85
			Total Non-Critical Cost		\$88,057.10
			Total Allowance Standard Cost		\$221,051.95

Pictures of the 938G v2 AS contents:

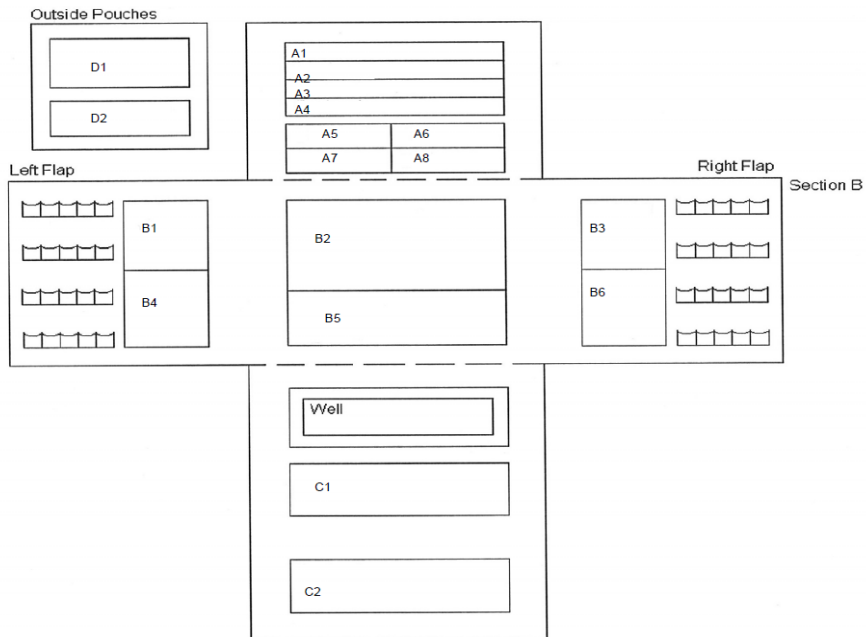
938GAA Mobile Field Surgical Team (MFST) –Anesthesia Element



938GAB – Mobile Field Surgical Team (MFST) Anesthesia Element Roll Bag



938GBA Mobile Field Surgical Team (MFST) –Emergency Medicine Element

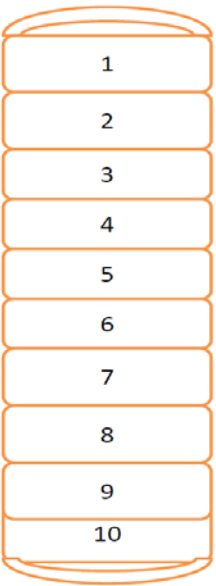


937GBA – Mobile Field Surgical Team Emergency Medical Element - Vest

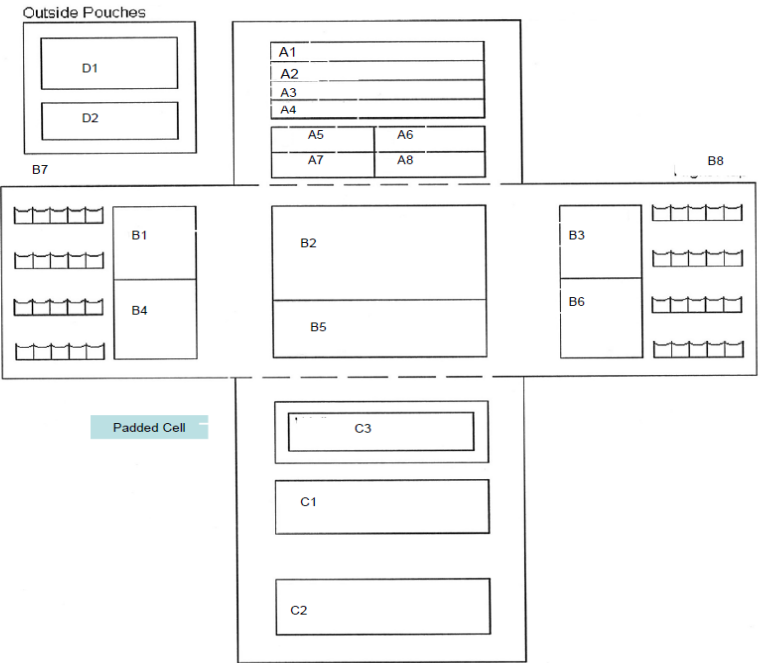
Vest



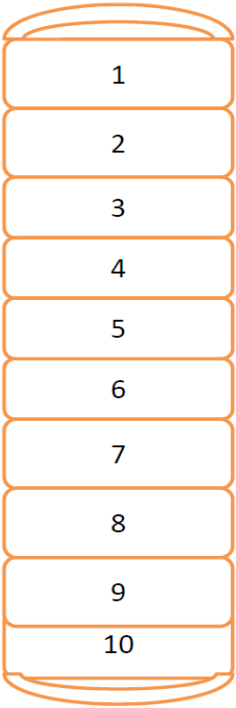
938GBB – Mobile Field Surgical Team (MFST)
Emergency Medicine Element Roll Bag



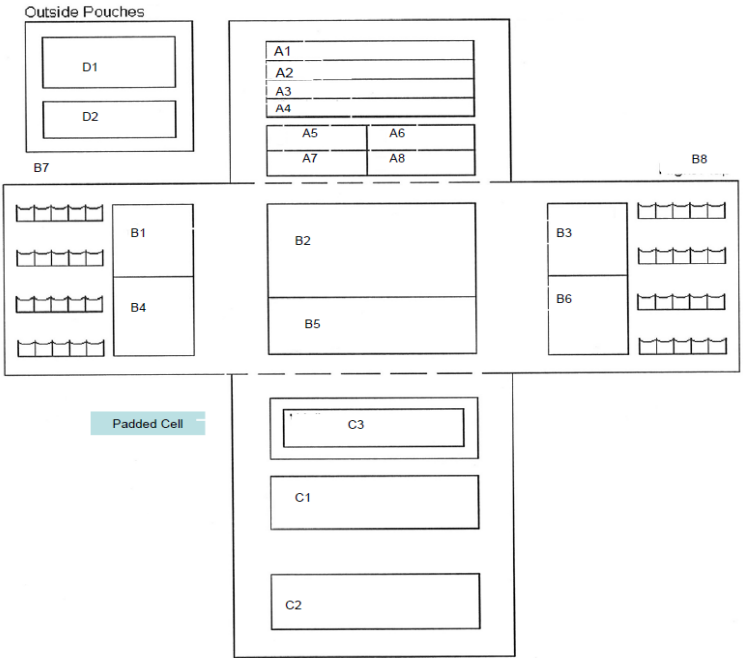
938GCA Mobile Field Surgical Team (MFST) – General Surgery Element



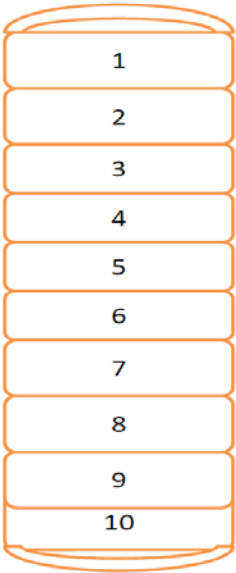
938GCB – Mobile Field Surgical Team (MFST)
General Surgery Element Roll Bag



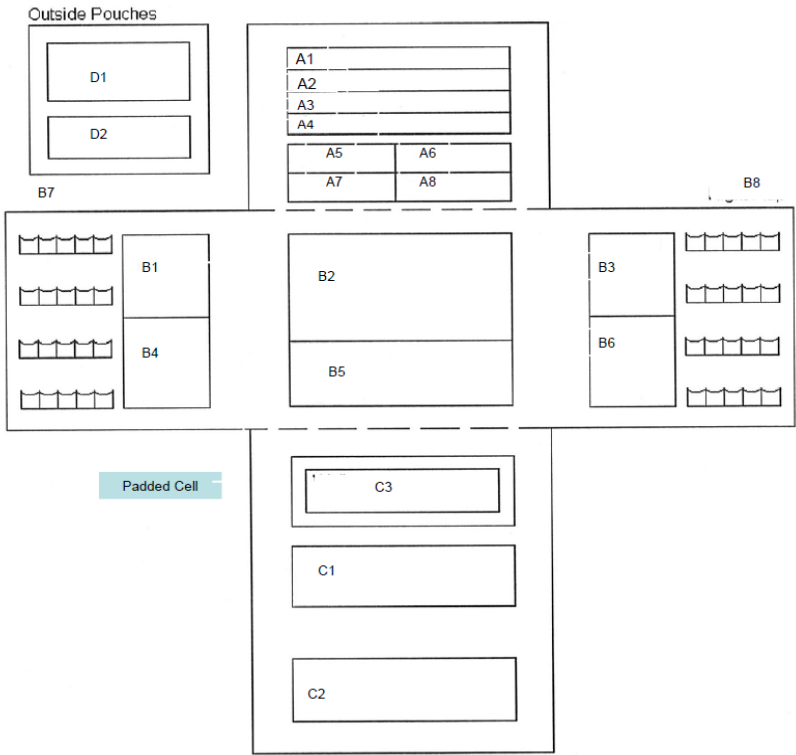
938GDA Mobile Field Surgical Team (MFST) – OR Element



938GDB – Mobile Field Surgical Team (MFST)
OR Element Roll Bag



938GEA Mobile Field Surgical Team (MFST) – Orthopedic Surgery Element



938GFA – MOBILE FIELD SURGICAL TEAM
SUPPLEMENTAL MEDICAL BAG



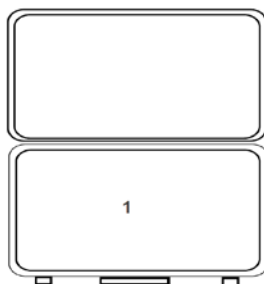
938GFB Mobile Field Surgical Team (MFST)
Ultrasound Bag



938GGA – MOBILE FIELD SURGICAL TEAM
SUPPLEMENTAL NON-MEDICAL BAG



938GHA – Mobile Field Surgical Team
Narcotics Case – Hand Carry



938GIA – MOBILE FIELD SURGICAL TEAM
LITTERS AND SINKS



938GJA Mobile Field Surgical Team (MFST)

Blood Analyzer Bag



938GKA –Mobile Field Surgical Team (MFST)

Refrigerator Bag



TC CET & TCCSA (TC CET-E) Capability Allowance Standards								
887 C v2 AS (Sub-Assemblage)	Item Count	Cost	887S v2 AS (Sub-Assemblage)	Item Count	Cost	887T v2 AS (Sub-Assemblage)	Item Count	Cost
AA – Equipment Bag 1	49	\$122,944.82	A1 – Bulk Bag	21	\$40,619.74	Supplies	75	15,100.71
AB – Back Pack Left Pack 1	91	\$11,178.63	A2 – Anesthesia Bag	218	\$36,149.67	Total Item Count	75	
AC – Back Pack Right Pack 1	80	\$4,641.04	B1 – 1 st Case/Surgery Supply	156	\$20,507.87	Total Critical Cost		\$0
AD – Narcotic Box 1	6	\$161.02	B2 – Case 2 & 3	146	\$12,387.67	Total Non-Critical Cost		\$15,100.71
BA – Equipment Bag 2	49	\$122,944.82	CM - AWIS	4	\$14,985.42	Total Allowance Standard Cost		\$15,100.71
BB – Back Pack Left Pack 2	91	\$11,175.63	MS – Misc	5	\$8,258.03			
BC - Back Pack Right Pack 2	81	\$4,650.92	NB – Narcotic Box	5	\$158.27			
BD – Narcotic Box 2	6	\$161.02	NC – Narcotic Case 2	5	\$158.27			
CA – Equipment Bag 3	49	\$122,944.82	OR – Set Up Bag	12	\$16,348.08			
CB – Back Pack Left Pack 3	91	\$11,175.63	Total Item Count	572				
CC – Back Pack Right Pack 3	80	\$4,641.04	Total Critical Cost		\$0			
CD – Narcotic Box 3	6	\$161.02	Total Non-Critical Cost		\$149,573.00			
Total Item Count	679		Total Allowance Standard Cost		\$149,573.00			
Total Critical Cost		\$203,377.58						
Total Non-Critical Cost		\$213,399.82						
Total Allowance Standard Cost		\$416,777.40						

Pictures of the 887C v2 AS contents:





One Complete Kit Below:



SOST Capability Build-up Allowance Standards								
912C v2 AS (Sub-Assemblage)	Item Count	Cost	912D v2 AS (Sub-Assemblage)	Item Count	Cost	912M v2 AS (Sub-Assemblage)	Item Count	Cost
AA – Litter Bag 1	13	\$820.48	AA- Trauma Rolls	47	\$8,401.24	AA - Infrastructure	35	\$61,728.61
AB – Litter Bag 2	17	\$1,637.71	AB – ACLS Kit	44	\$1,544.10	AB – IV Fluids	7	\$794.48
BA – Singe Bag 1	159	\$27,073.67	AC - Airway	20	\$1,573.00	AC – Trauma Resupply	16	\$3,231.41
BB – Single Bag 2	116	\$19,206.46	AD – IV Rolls	68	\$3,824.48	AD – Airway Resupply	40	\$4,746.37
CA – SOST ER Meds	102	\$3,043.60	BA – On FOB	97	\$99,494.43	AE – Equipment Support	20	\$4,316.50
CB – SOST ER Trauma	99	\$5,860.25	CA – Hanging Bag 1	44	\$2,687.55	AF – Medications	42	\$5,480.23
CC – SOST ER Electronics	28	\$24,588.22	DA – Hanging Bag 2	41	\$1,472.21	AF – IV Supplies	42	\$4,490.23
CD – SOST ER Electronics Bag 2	19	\$29,723.19	EA – Mass Casualty Pelicans	24	\$6,386.96	AH – Magic Bag Resupply	162	\$34,896.22
CE – SOST Electronics Accessories	17	\$3,548.17	FA – IFAK Team	31	\$3,650.29	Total Item Count	364	
CF – Anes Electronics Bag 1	25	\$24,251.71	GA – Emergency ACLS Bag Red	16	\$1,590.15	Total Critical Cost		\$0.00
CG – Anes Electronics Bag 2	16	\$26,033.36	GB – Cardiac Pressure Meds Bag	10	\$159.12	Total Non- Critical Cost		\$119,684.28
DA – Anes Bag Set	143	\$10,019.59	GC – Sedation/RSI Medication Bag Yellow	8	\$340.15	Total Allowance Standard Cost		\$119,684.28
EA – Traveling Bag	56	\$5,142.09	GD – Antibiotic Bag White	12	\$568.95			
FA – Cooling Case	6	\$3,654.36	GE – Cardiac Med Bag Blue	15	\$440.34			
Total Item Count	816		GF – Respiratory Med Bag Red	7	\$80.94			
Total Critical Cost		\$0.00	GG – Misc Med Bag Green	22	\$312.53			
Total Non-Critical Cost		\$184,602.85	GH – Narc Pelican	10	\$2,030.09			
Total Allowance Standard Cost		\$184,602.85	HA – Magic Bag	334	\$30,934.04			
			IA – Surgical Electronics	23	\$17,136.75			
			JA – Anesthesia Five Case	183	\$15,714.34			
			Total Item Count	1056				
			Total Critical Cost		\$0.00			
			Total Non-Critical Cost		\$198,332.67			
			Total Allowance Standard Cost		\$198,332.67			

SOST Capability Build-up Allowance Standards (Cont)								
912N v2 AS (Sub-Assemblage)	Item Count	Cost	912Q v2 AS (Sub-Assemblage)	Item Count	Cost	912R v2 AS (Sub-Assemblage)	Item Count	Cost
AA – SOCCET ER Meds	92	\$2,739.34	AA – ER Meds Basic	153	\$15,994.47	Stand-alone assets	37	\$16,696.59
AB – SOCCET ER Trauma	108	\$10,295.09	AB – ER Meds Increased	127	\$7,791.52	Total Item Count	37	
BA – SOCCET RT Jump Bag	90	\$4,135.06	AC – ER Meds Max Capability	121	\$8,118.48	Total Critical Cost		\$0.00
BB – RT Electronics	20	\$23,868.26	BA – RN Trauma Basic	93	\$6,711.50	Total Non-Critical Cost		\$16,696.59
CA – SOCCET RN Trauma	101	\$9,006.26	BB – RN Trauma Increased Capability	84	\$3,572.43	Total Allowance Standard Cost		\$16,696.59
CB – RN Electronics	27	\$24,464.10	BC – RN Trauma Max Capability	103	\$6,922.90			
DA – Travel Bag	48	\$4,327.97	CA – RT Jump Basic	92	\$4,046.13			
FA – Electronic Accessory Bag	12	\$2,034.42	CB – RT Jump Increased Capability	91	\$6,373.49			
GA – Cooling Case	1	\$3,507.00	CC – RT Jump Max Capability	72	\$4,067.25			
Total Item Count	499		DA – Electronics	30	\$103,839.5			
Total Critical Cost		\$0.00	EA – Narcotics	10	\$2,100.54			
Total Non-Critical Cost		\$84,377.50	FA – Refrigerator Items	16	\$3,614.68			
Total Allowance Standard Cost		\$84,377.50	GA – Litter Bag	7	\$2,403.29			
			Total Item Count	999				
			Total Critical Cost		\$0.00			
			Total Non-Critical Cost		\$175,506.20			
			Total Allowance Standard Cost		\$175,506.20			

Pictures of the SOST AS contents:

912C Sub-section AA

6515015928802 Backpack Front



912C Sub-section AB
6760014912179 Pelican 1500NF



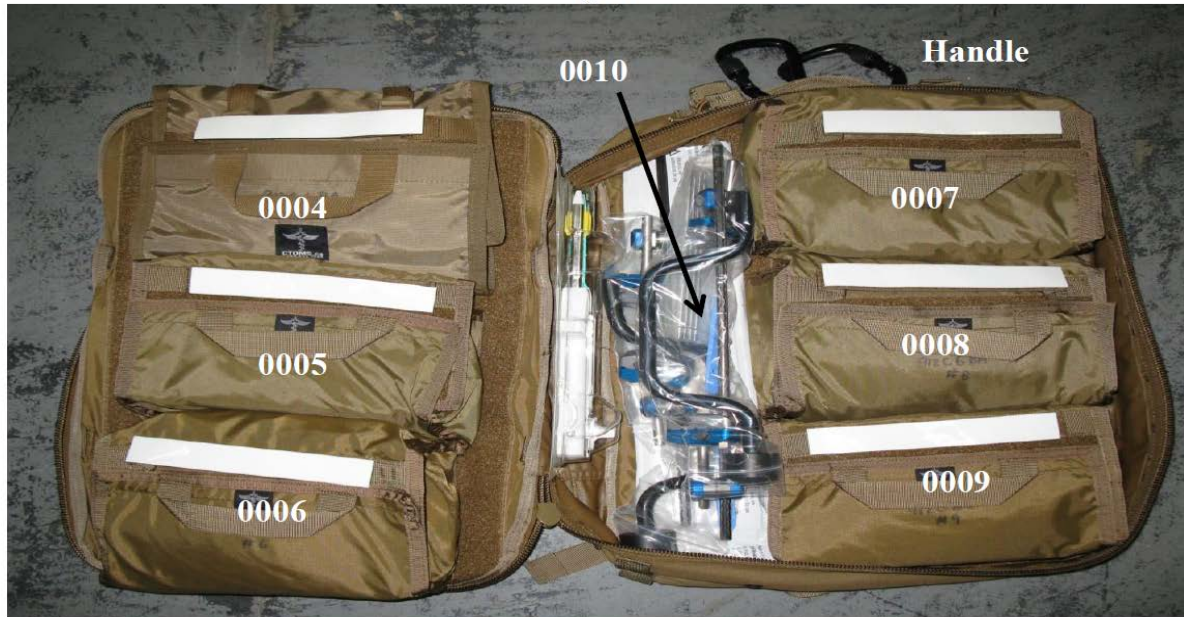
912C Sub-section BA
6515015928802 Backpack Front

Closed



912C Sub-section BA 6515015928802 Backpack Front

Open



912C Sub-section BA 6515015928797 Backpack Back Side

Open



912C Sub-section CA 6515015928802 Backpack Front



912C Sub-section CC 6515015928802 Backpack Front



912C Sub-section CD

6515015928797 Backpack Back Side



912C Sub-section CE

6515015928802 Backpack Front

Equipment Accessory Bag 1



6515015422115
Blood Fluid Warmer
Accessories



6515015865646
MP2 Vital Signs Monitor
Accessories



6515015912829
Suction Apparatus
6515015711689
Ventilator
Accessories



6515015965311
Infusion Pump Accessories

912C Sub-section CE

6515015928797 Backpack Back Side

Equipment Accessory Bag 2



6630015205212
ISTAT Analyzer Blood Gas
Accessories



6515015848615
Ultrasound Unit Diag
Accessories



912C Sub-section DA

6515015928802 Backpack Front

Open



912C Sub-section DA 6515015928797 Backpack Back Side

Open



LOC: 0012 Behind LOC:'s 0009, 0010, 0011

912C Sub-section EA



**8465015176319
Duffel Bag**



**8465015973586
Field Pack Malice**

912C Sub-section FA



912 D Sub-Section AA Thru AB Pelican Packout



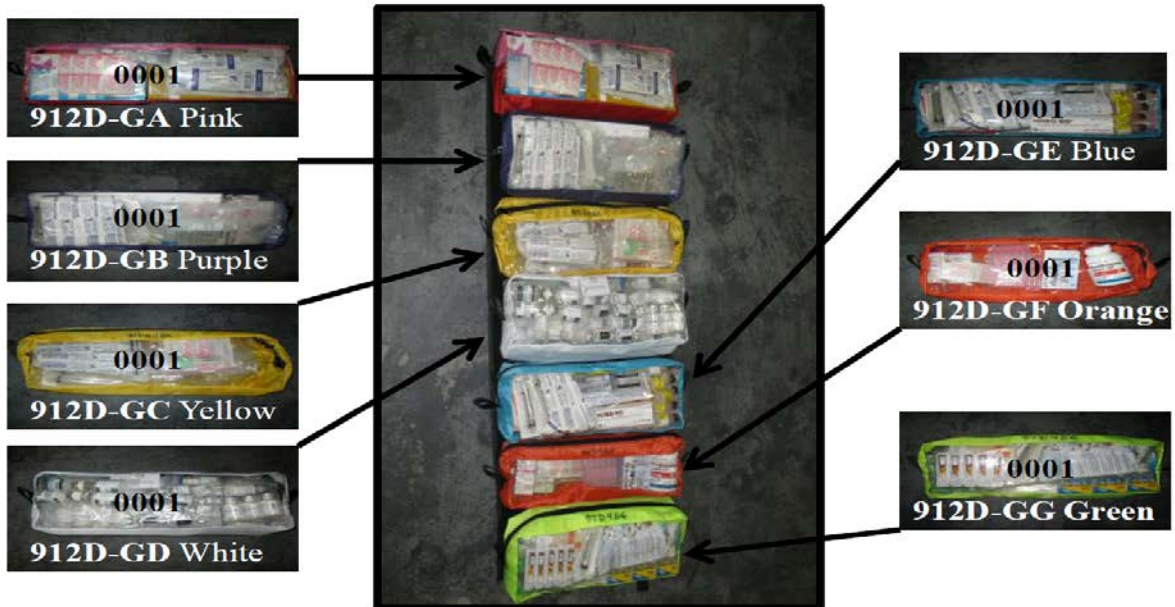
***912 D Sub-Sections AC and AD
Pelican Packout***



***912 D Sub-Section GA Thru GG
Pelican Packout***



***912 D Sub-Section GA Thru GG
Assembled Packout***



***912 D Sub-Section AA
TRAUMA ROLLS
Hanging Bag (A)***



***912 D Sub-Section AA
TRAUMA ROLLS
Hanging Bag (B)***



***912 D Sub-Section AB
ACLS KIT
Drug Roll***



***912 D Sub-Section AC
AIRWAY***



***912 D Sub-Section AD
IV ROLLS
Drug Roll***



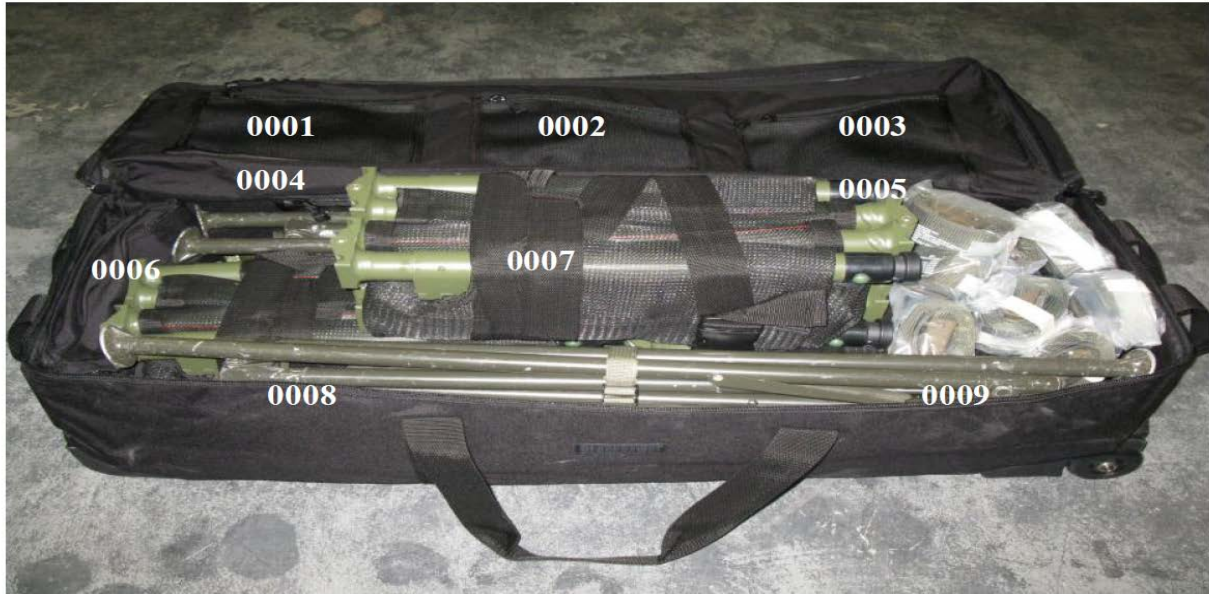
***912 D Sub-Section AD
IV ROLLS
Hanging Bag (A)***



***912 D Sub-Section BA
On-FOB
Duffle Bag 1***



***912 D Sub-Section BA
On-FOB
Duffle Bag 3***



***912 D Sub-Section HA
MAGIC BAG***



***912 D Sub-Section BA
On-FOB
Refrigeration Containers***



***912 D Sub-Section IA
SURGICAL ELECTRONIC
Pelican 2***



912 D Sub-Section JA
ANESTHESIA FIVE CASE
Pelican 2

